

STUDIES OF TREES
IN WINTER



ANNIE OAKES HUNTINGTON

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SWAMP WHITE OAK

Quercus bicolor

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STUDIES *of* TREES IN WINTER

*A Description of the Deciduous Trees of
Northeastern America*

BY

ANNIE OAKES HUNTINGTON

WITH AN INTRODUCTION

By CHARLES S. SARGENT, LL.D.

DIRECTOR OF THE ARNOLD ARBORETUM AND AUTHOR OF THE
"SILVA OF NORTH AMERICA"

*ILLUSTRATED WITH COLORED PLATES BY MARY
S. MORSE, AND PHOTOGRAPHS BY
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TO

My Two Friends

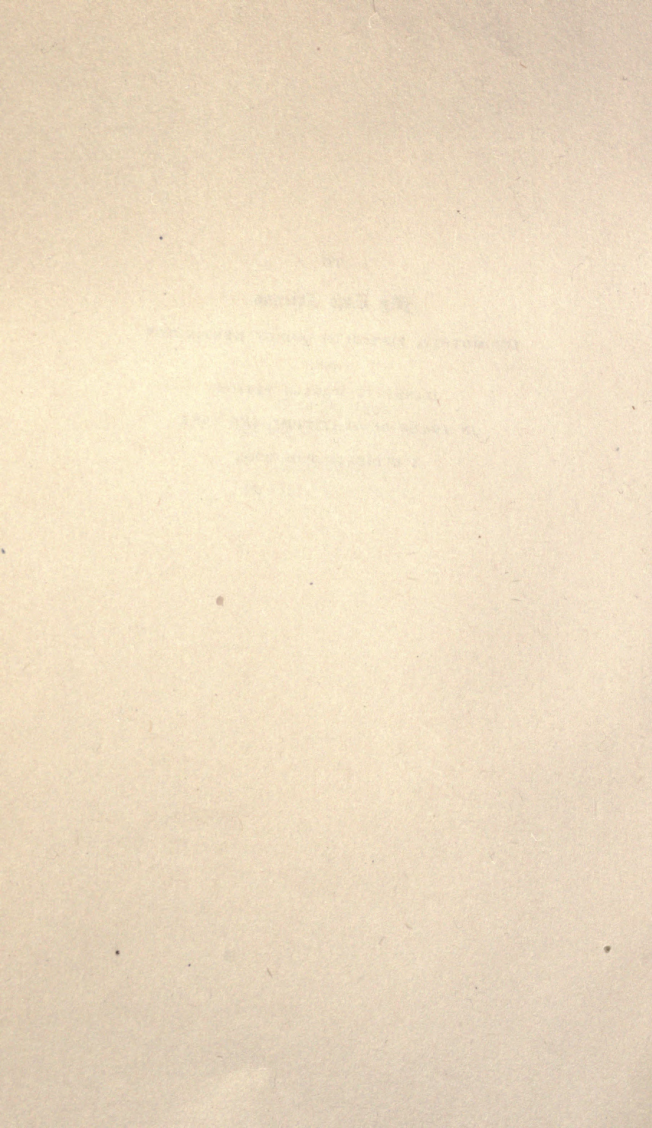
MY MOTHER, ELIZABETH QUINCY HUNTINGTON

AND

JEANNETTE WARREN PAYSON

IN TOKEN OF GRATITUDE AND LOVE

I DEDICATE THIS BOOK



CONTENTS

	PAGE
PREFACE	xv
INTRODUCTION	xvii
ANALYTICAL KEY TO THE FAMILIES OF TREES IN WINTER	xxi
CHAPTER	
I. THE STUDY OF TREES IN WINTER	3
Trunk and branches. Stems and twigs. Leaf-scars. Bundle-scars. Buds.	
II. THE HORSECHESTNUT	15
The Horsechestnut. The Ohio Buckeye.	
III. THE MAPLES	21
Sugar or Rock Maple. Red or Swamp Maple. White or Silver Maple. Striped Maple or Moose- wood. Ash-leaved Maple or Box Elder. Norway Maple. Sycamore Maple.	
IV. THE ASHES	35
The White or American Ash. Red or Downy Ash. Black Ash. European Ash.	
V. THE WALNUTS AND HICKORIES	45
Butternut. Black Walnut. Shagbark or Shell- bark Hickory. Mockernut or Whiteheart Hick- ory. Bitternut Hickory. Pignut Hickory.	
VI. THE BIRCHES, HOP HORNBEAM, AND HORNBEAM	59
Canoe, Paper, or White Birch. American, Gray, or White Birch. Black or Sweet Birch. Yel- low Birch. Red or River Birch. Dwarf Birch. European White Birch. Hop Hornbeam, Iron- wood. Hornbeam, Blue Beech.	

CONTENTS

CHAPTER	PAGE
<p>VII. THE BEECH, CHESTNUT, AND OAKS</p> <p style="padding-left: 40px;">American Beech. European Beech. Chestnut Oak. White Oak. Swamp White Oak. Mossycup, Overcup, or Bur Oak. Chestnut or Rock Chestnut Oak. Dwarf Chestnut Oak. Post or Rough Oak. Black Oak. Red Oak. Pin Oak. Scrub Oak.</p>	<p>77</p>
<p>VIII. THE ELMS AND THE HACKBERRY</p> <p style="padding-left: 40px;">American or White Elm. Slippery or Red Elm. Cork or Rock Elm. English Elm. Scotch, Dutch, or Wych Elm. Hackberry, Sugarberry, Nettle tree.</p>	<p>101</p>
<p>IX. THE BUTTONWOOD, THE TUPELO, AND THE MULBERRIES</p> <p style="padding-left: 40px;">Buttonwood, Sycamore, or Plane tree. Tupelo, Pepperidge, Sour Gum tree. Flowering Cornel, Flowering Dogwood. Red Mulberry. White Mulberry.</p>	<p>117</p>
<p>X. THE LOCUSTS, THE YELLOWWOOD, AND THE KENTUCKY COFFEE TREE</p> <p style="padding-left: 40px;">Common Locust. Honey Locust. Yellowwood. Kentucky Coffee tree. Laburnum. Judas tree.</p>	<p>129</p>
<p>XI. THE LINDENS, THE LIQUIDAMBER, AND THE SASSAFRAS</p> <p style="padding-left: 40px;">Linden, Basswood. European Linden. Liquidamber, Sweet Gum. Hamamelis. Sassafras.</p>	<p>141</p>
<p>XII. THE MAGNOLIA AND TULIP TREE, THE CATALPA, THE AILANTHUS, AND THE ARALIA</p> <p style="padding-left: 40px;">Swamp Magnolia, Sweet Bay. Umbrella tree. Cucumber tree. Tulip tree. Catalpa. Ailanthus, Tree of Heaven. Angelica tree, Hercules' Club.</p>	<p>153</p>

CONTENTS

CHAPTER	PAGE
XIII. THE APPLE TREE, PEAR TREE, MOUNTAIN ASH, CHERRY TREE, AND THE SHAD BUSH . . .	167
Common Apple tree. Common Pear tree. Mountain Ash, or Rowan tree. Wild Black Cherry. Choke Cherry. Pin Cherry. Peach tree. Shad Bush. Service Berry, June Berry.	
XIV. THE WILLOWS AND POPLARS	177
White Willow. Weeping Willow. Black Willow. Aspen, American Aspen. Large-toothed Aspen. Balm of Gilead, Balsam Poplar. Cottonwood, Necklace, or Carolina Poplar. Lombardy Poplar. White Poplar.	
XV. THE LARCH	187
American Larch. Tamarack or Hackmatack. European Larch.	

STORY

1. The first part of the story is about the beginning of the world. It describes how the world was created and how the first people appeared. It is a very interesting and important part of the story.

2. The second part of the story is about the life of the first people. It describes how they lived, what they did, and how they grew up. It is a very interesting and important part of the story.

3. The third part of the story is about the end of the world. It describes how the world came to an end and how the first people were destroyed. It is a very interesting and important part of the story.

LIST OF ILLUSTRATIONS

	PAGE
Swamp White Oak. <i>Quercus bicolor</i> . . .	Frontispiece
Cross section of a tree. (Colored plate)	4
Horsechestnut. <i>Æsculus Hippocastanum</i>	14
Horsechestnut shoot	16
Section of a Horsechestnut bud. (Colored plate) .	18
The Maples. (Colored plate)	20
Sugar Maple. <i>Acer saccharum</i>	22
Trunk of a young Sugar Maple	23
Red Maple. <i>Acer rubrum</i>	24
Trunk of a young Red Maple	25
Silver Maple. <i>Acer saccharinum</i>	26
Moosewood Maple. <i>Acer pennsylvanicum</i>	28
Norway Maple. <i>Acer platanoides</i>	30
Sycamore Maple. <i>Acer Pseudo-Platanus</i>	32
The Ashes. (Colored plate)	34
American Ash. <i>Fraxinus americana</i>	36
Walnuts and Hickories. (Colored plate)	44
Butternut. <i>Juglans cinerea</i>	46
Trunk of a Butternut	47
Black Walnut. <i>Juglans nigra</i>	48
Trunk of a Black Walnut	49
Shagbark Hickory. <i>Carya ovata</i>	50

LIST OF ILLUSTRATIONS

	PAGE
Trunks of Shagbark Hickories	51
Mockernut Hickory. <i>Carya alba</i>	52
Bitternut Hickory. <i>Carya cordiformis</i>	54
Pignut Hickory. <i>Carya glabra</i>	56
Canoe Birch. <i>Betula papyrifera</i>	58
Gray Birches. <i>Betula populifolia</i>	60
Black Birch. <i>Betula lenta</i>	62
Yellow Birch. <i>Betula lutea</i>	64
Red Birch. <i>Betula nigra</i>	66
European White Birch. <i>Betula alba</i>	68
Hop Hornbeam. <i>Ostrya virginiana</i>	70
Hornbeams. <i>Carpinus caroliniana</i>	72
The Beech and Chestnut. (Colored plate)	76
Beech trees. <i>Fagus grandifolia</i>	78
Trunk of a young Beech.	80
Chestnut. <i>Castanea dentata</i>	82
The Oaks. (Colored plate)	83
White Oak. <i>Quercus alba</i>	84
Trunk of a White Oak	86
Mossy-cup Oak. <i>Quercus macrocarpa</i>	88
A young Post Oak. <i>Quercus stellata</i>	90
Black Oak. <i>Quercus velutina</i>	92
Red Oak. <i>Quercus rubra</i>	94
Trunk of a Red Oak.	96
Pin Oak. <i>Quercus palustris</i>	98
The American and Slippery Elms. (Colored plate)	100
American Elm. <i>Ulmus americana</i>	102
Young Cork Elm. <i>Ulmus racemosa</i>	106
English Elms. <i>Ulmus campestris</i>	108
Scotch Elm. <i>Ulmus glabra</i>	110

LIST OF ILLUSTRATIONS

	PAGE
Hackberry. <i>Celtis occidentalis</i>	112
Buttonwood stem and bud. (Colored plate)	116
Buttonwood. <i>Platanus occidentalis</i>	118
Trunk of a Buttonwood	119
Tupelo. <i>Nyssa sylvatica</i>	120
Red Mulberry. <i>Morus rubra</i>	122
White Mulberry. <i>Morus alba</i>	124
The Locusts. (Colored plate).	128
Common Locust trees. <i>Robinia Pseudo-Acacia</i>	130
Honey Locust. <i>Gleditsia triacanthos</i>	132
Kentucky Coffee tree. <i>Gymnocladus dioica</i>	134
Linden, Liquidamber, and Sassafras. (Colored plate)	140
American Linden. <i>Tilia americana</i>	142
Liquidamber. <i>Liquidambar Styraciflua</i>	144
Sassafras. <i>Sassafras variifolium</i>	146
Trunk of a Sassafras	148
Magnolia and Tulip tree. (Colored plate)	152
Tulip tree. <i>Liriodendron Tulipifera</i>	156
Catalpa. <i>Catalpa speciosa</i>	158
Ailanthus. <i>Ailanthus glandulosa</i>	160
Hercules' Club. <i>Aralia spinosa</i>	162
Mountain Ash. <i>Pyrus americana</i>	166
A young Black Cherry tree. <i>Prunus serotina</i>	170
White Willows. <i>Salix alba</i>	176
Aspens. <i>Populus tremuloides</i>	180
American Larch. <i>Larix laricina</i>	186
European Larch. <i>Larix decidua</i>	188

LIST OF ILLUSTRATIONS

101	Fig. 1. Plan of the site.
102	Fig. 2. Section through the site.
103	Fig. 3. Plan of the site.
104	Fig. 4. Section through the site.
105	Fig. 5. Plan of the site.
106	Fig. 6. Section through the site.
107	Fig. 7. Plan of the site.
108	Fig. 8. Section through the site.
109	Fig. 9. Plan of the site.
110	Fig. 10. Section through the site.
111	Fig. 11. Plan of the site.
112	Fig. 12. Section through the site.
113	Fig. 13. Plan of the site.
114	Fig. 14. Section through the site.
115	Fig. 15. Plan of the site.
116	Fig. 16. Section through the site.
117	Fig. 17. Plan of the site.
118	Fig. 18. Section through the site.
119	Fig. 19. Plan of the site.
120	Fig. 20. Section through the site.

P R E F A C E

THE analytical key of trees in winter which accompanies the new edition of this volume is based largely on the contrasting characters of the buds, leaf-scars, and stems, and is intended for those who come in from a walk, or from studying trees out of doors, and wish to identify the specimens they have gathered. By following the key step by step, and carefully comparing the specimens, the family is determined, and the student referred to the page where the different species are described.

I have purposely included certain familiar trees not indigenous to the Northeastern States, but ordinarily met with, because it seemed more useful to help the beginner to know each tree with which he comes in contact than to make a classification which follows strictly geographical lines.

I gratefully acknowledge my thanks to Professor Sargent for his kind assistance in compiling the key.

A. O. H.

JAMAICA PLAIN, January, 1910.

PREFACE

This manual is for the use of the student in the laboratory. It is intended to be a guide to the student in the laboratory, and to be used in connection with the lectures. It is not intended to be a substitute for the lectures, but to be used in connection with them. It is intended to be a guide to the student in the laboratory, and to be used in connection with the lectures. It is not intended to be a substitute for the lectures, but to be used in connection with them.

A. O. H.

INTRODUCTION

WHEN Miss Huntington told me last year that she was going to write a book about the trees in their winter aspects, knowing how conscientiously she had studied her subject and how successful she had been in imparting the results of her observation to others, I felt sure that she would do a useful and excellent piece of work, and that her book would be of real assistance to all persons who want to gain some knowledge of the trees which they pass in their daily walks.

The promise of the book is now fulfilled, and nothing is left for the introducer to do but to call attention in a general way to the beauty of trees in winter and to the pleasure and profit of studying them at this season of the year, as well as when their branches are clothed with leaves or covered with flowers or fruits.

To the real lover of trees they are equally beautiful and interesting at all seasons of the

STUDIES OF TREES IN WINTER

year; and no one knows trees well who cannot distinguish the different species as easily and surely in winter as in spring or summer. Almost every tree has some special and peculiar beauty which is seen to the best advantage in winter. The fine spray of the beech is seen only at this season of the year, and there are few more beautiful objects in nature than the delicate branches of our New England beech trees seen against the clear blue sky of a brilliant winter day. The sturdiness of the oak is best realized in winter, for at other seasons its massive limbs are often hidden under their covering of leaves. The birch is far more graceful and attractive in winter than at any other period; and there is nothing more stimulating to the lover of nature than to stand on a bright winter's day and look up into the marvellous structure of one of the great elm trees which are the pride of New England. The bark of most trees appears more beautiful in winter than at other seasons of the year because the eye, undisturbed by the contemplation of the foliage, can then most easily take in all the details of its varied texture and wonderful colors.

For the student of trees searching for accurate knowledge it is as important to study

INTRODUCTION

trees in winter as in summer. The differences in the various families of trees, once these are understood, are marked enough to make family relationships easy to recognize at this season of the year. Nor will it be found difficult, once the characters peculiar to each kind of tree are fixed in the mind of the observer, to determine the various species; and these winter characters are often more constant and stable than characters derived from the flowers, the shape of the leaves, or from the size and shape of the fruits, on which dependence is usually placed for the identification of trees.

Each species of tree has its peculiar habit, which is best seen in winter and which it usually retains under normal conditions. The character of the bark rarely changes much on individuals of the same age, although the bark of old trees is usually very different from the bark of young trees of the same species; and the color of the branchlets and the form and size of the winter buds generally afford certain means of determining closely related trees.

In each kind of tree there is, in addition to its general habit, which with a little practice is frequently sufficient to make the recognition of a particular species easy, some special character which enables the student to confirm his deter-

STUDIES OF TREES IN WINTER

mination and to distinguish a particular species of oak or hickory or poplar from every other.

A knowledge of trees, the ability at least to recognize and identify them, adds vastly to the pleasures of life. One who knows trees well meets them like old friends; each season invests them with fresh charm, and the more we study and know them the greater will be our admiration of the wonderful variety and beauty which they display in winter.

C. S. SARGENT.

ARNOLD ARBORETUM, November, 1901.

ANALYTICAL KEY
TO THE FAMILIES OF TREES IN WINTER

1. LEAF-SCARS OPPOSITE.

A. Buds large, gummy; scales overlapping; leaf-scars prominent. **Horsechestnut.** (*Æsculus*, p. 15.)

B. Buds small, not gummy.

Twigs slender.

Twigs glaucous; bud-scales delicate. **Maple.**
(*Acer*, p. 21.)

Recent shoots pubescent; flower-buds round,
conspicuous, their tips curved. **Cornel.**
(*Cornus*, p. 121.)

Twigs stout.

Twigs gray, flattened at the nodes; bud-scales
leathery. **Ash.** (*Fraxinus*, p. 35.)

Twigs glaucous; leaf-scars often in whorls of
three. **Catalpa.** (*Catalpa*, p. 158.)

2. LEAF-SCARS ALTERNATE.

A. Trees with thorns or prickles.

a. Buds superposed, hidden within the stem.

Thorns long and branched; terminal bud absent.
Honey Locust. (*Gleditsia*, p. 132.)

Prickles inconspicuous, in the position of stipules.
Common Locust. (*Robinia*, p. 129.)

b. Buds not superposed or hidden within the stem;
stems coarse, covered with prickles; pith con-
spicuous. **Hercules' Club.** (*Aralia*, p. 162.)

STUDIES OF TREES IN WINTER

2. LEAF-SCARS ALTERNATE (*continued*).

B. Trees not armed with thorns or prickles.

1. Buds naked (without scales).

Lateral buds superposed ; pith brown, chambered.

Walnut. (*Juglans*, p. 45.)

Buds curved, flattened, orange-colored. **Bitternut.** (The only northern Hickory with naked buds.) (*Carya cordiformis*, p. 53.)

Buds acuminate, light brown, enclosed by the deciduous stipules of unfolded leaves ; woody capsules persistent on the branches. **Witch Hazel.** (*Hamamelis*, p. 146.)

2. Buds with scales.

a. Branch ending in a terminal bud.

Buds covered by numerous scales.

Twigs slender.

Upper axillary buds clustered at the apex of the twig ; pith 5-angled. **Oak.** (*Quercus*, p. 83.)

Upper axillary buds not clustered.

Buds narrow, acuminate, about one inch long. **Beech.** (*Fagus*, p. 77.)

Buds acute, chestnut brown, slightly pubescent, not more than $\frac{1}{4}$ inch long. **Shad Bush.** (*Amelanchier*, p. 173.)

Buds light brown ; recent shoots channeled in two grooves. **Chestnut.** (*Castanea*, p. 81.)

Buds smooth, dark red ; stipule-scars present. **Linden.** (*Tilia*, p. 141.)

ANALYTICAL KEY

2. LEAF-SCARS ALTERNATE (*continued*).

Buds small, acute, reddish brown ; bundle-scars on leaf-scars borne in a circle ; juice milky. **Mulberry.** (*Morus*, p. 123.)

Buds ovate ; twigs green, slightly aromatic ; pith thick, mucilaginous. **Sassafras.** (*Sassafras*, p. 147.)

Buds obtuse, dark red, their scales hairy ; twigs with red leaf-scars and stout spur-like branchlets. **Tupelo.** (*Nyssa*, p. 120.)

Buds small, covered by closely overlapping scales ; twigs slender, with pungent odor ; leaf-scars oval. **Cherry.** (*Prunus*, p. 171.)

Buds acute, orange-brown ; twigs furnished with corky wings ; pith pentagonal in shape. **Liquidamber.** (*Liquidambar*, p. 144.)

Twigs stout, buds large.

Buds with loosely appressed scales ; leaf-scars conspicuous ; stipule-scars absent. **Hickory**, except *Carya cordiformis*. (*Carya*, p. 49.)

Buds with closely appressed pubescent scales ; leaf-scars V-shaped, less conspicuous ; stipule-scars present. **Mountain Ash.** (*Pyrus*, p. 170.)

Buds covered by imbricated scales, resinous and gummy. **Poplar.** (*Populus*, p. 179.)

Buds covered by a single scale of two connate stipules.

Branchlets slender.

Lateral buds often larger than the terminal bud. **Willow.** (*Salix*, p. 177.)

Buds compressed, obtuse ; branches purplish brown. **Tulip Tree.** (*Liriodendron*, p. 155.)

STUDIES OF TREES IN WINTER

2. LEAF-SCARS ALTERNATE (*continued*).

Branchlets stout except in *Magnolia virginiana* ; buds acute. **Magnolia.** (*Magnolia*, p. 153.)

b. Branch without a terminal bud, prolonged by the growth of an upper axillary bud.

Bud scales numerous (except in *Ailanthus*.)

Twigs slender.

Twigs with conspicuous catkin-buds.

Buds slender, elongated, sticky. **Birch.** (*Betula*, p. 59.)

Buds ovate, elongated. **Hop Hornbeam.** (*Ostrya*, p. 71.)

Buds small, obtuse. **Hornbeam.** (*Carpinus*, p. 72.)

Twigs without catkin-buds.

Buds ovate, acute, dark brown ; pith not chambered. **Elm.** (*Ulmus*, p. 101.)

Buds ovate, acute ; pith white, chambered. **Hackberry.** (*Celtis*, p. 112.)

Buds obtuse, chestnut brown, superposed ; flower-buds oval. **Judas Tree.** (*Cercis*, p. 136.)

Twigs stout.

Buds flattened, covered by two outer scales ; pith chocolate brown. **Ailanthus.** (*Ailanthus*, p. 160.)

Bud scales only one ; buds ovate. **Buttonwood.** (*Platanus*, p. 117.)

Buds naked (without scales).

Buds axillary, superposed, four together, flattened by mutual pressure into an acuminate cone ; branchlets slender. **Yellowwood.** (*Cladrastis*, p. 134.)

CHAPTER I

THE STUDY OF TREES
IN WINTER

Chapter I

THE STUDY OF TREES IN WINTER

OUTSIDE my window the trees in a little wood stand leafless. Everything which made this wood a delight in June, the contrast of light and shade among the leaves, the varying tones of green in broken sunlight, the warmth and color and summer freshness, has gone, but the trees themselves, in all their wealth of foliage were never so beautiful as now. The massive moulding of their trunks, the graceful curves of their branches, the fine tracery of their little bare twigs, now clear against the sky and again lost in a tangled network of intersecting branches, — the whole beauty of their symmetry, their poise, strength, and delicacy is revealed as it is never revealed in summer.

Attracted first by the obvious grace of the forms of trees as we see them from our windows in winter, we discover that a closer study of the details of bare twigs and buds in the woods discloses unsuspected beauty in texture, form,

STUDIES OF TREES IN WINTER

and color. Each tree has definite traits of its own which distinguish it from every other tree, and by tracing individual characteristics in the branches, trunk, stems, buds, and leaf-scars we are able to identify every tree with certainty.

Trunk and Branches

By observing the shapes and general outlines of trees in winter we are able to recognize them at a distance. This study of tree forms adds much to the pleasure of a railroad journey or a winter's drive in the country, and accuracy is acquired by constant practice when we walk in the woods and fields and can verify the name of each tree. In this way we become familiar with the common trees, and learn to know the pre-



TREE WITH A DELIQUESCENT
TRUNK

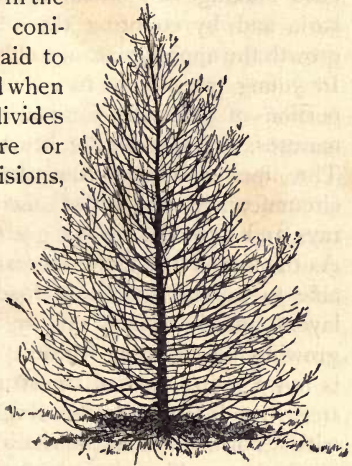
dominating trees of the forests through which we pass, often recognizing a rare species the distance of a field away.



Cross section of a tree trunk, showing the rings of annual growth, the medullary rays, the dark heartwood, the lighter sapwood and the bark.

THE STUDY OF TREES IN WINTER

There are two distinct plans of branching in trees. When the main trunk extends upward to the tip, as it does in the larch and other conical trees, it is said to be *excurrent*, and when the main stem divides into many more or less equal divisions, as we find it in the American elm and other spreading trees, it is said to be *deliquescent*, — the latter form is the most common one among our deciduous trees.



TREE WITH AN EXCURRENT TRUNK

The inner structure of these dicotyledonous trunks is seen when we examine the cross section cut of a felled tree. In the centre is the heartwood, the durable wood of commercial value, the cells of which are hard and dry; next it the soft sapwood, the living part of the tree containing cells filled with sap; then the cambium layer, the zone of growing cells,

STUDIES OF TREES IN WINTER

and outside of this the bark. Each year new cells are formed in the cambium layer, the inner ones making new wood, the outer ones new bark, and by counting these annual rings of growth the approximate age of the tree is found. In young trees there is a conspicuous central portion of pith which remains after the tree matures, as long as the heartwood is sound. The lines radiating from the centre to the circumference are called medullary or pith rays and form the "silver grain" of the wood. As the size of the trunk increases, the bark unable to expand, cracks in fissures or peels in layers, and is pushed off by the tremendous growing power from within. The heartwood is not a living part of the structure and often trees live for years without it,—hollow shells with a normal amount of vitality so long as the roots, the cambium layer and the buds are not injured.

Branches grow from the axillary or lateral buds on the stem, continuing their growth every year by the development and unfolding of new buds, both terminal and lateral. When the growth is carried on by the terminal buds, the tree is more apt to be regular in outline than when these are injured or killed and lateral buds develop the growth instead. Branches

THE STUDY OF TREES IN WINTER

vary in showing an upright, drooping, or horizontal habit of growth, as we see them in the Lombardy poplar, weeping willow and tupelo, and within these divisions there are other contrasts of rigidity and flexibility, with differences of color and texture as well.

Apart from the general shape of the tree, the bark on the trunk and branches is a constant help in identification. It is hard and smooth on some trees, like that of the hornbeam and beech, fissured into ridges like the sugar maple on others, it sometimes flakes off in rough plates like those of the shagbark hickory, and again in thin, brittle strips like those of the hop hornbeam, the bark peels off laterally as in the canoe birch, and occasionally becomes ridged and corky as we find it on the branches of the liquidamber and cork elm. Very often the color of the bark is distinctive as is that of the green stems of the sassafras and moosewood maple and the white, brown, pink, and yellow trunks of different birches. The taste and odor of the bark are also characteristic of certain species, as, for instance, the unpleasant, bitter taste of the black cherry, the mucilaginous taste of the slippery elm, and the aromatic fragrance of the stems of the mockernut hickory. The little dots on young bark are called

STUDIES OF TREES IN WINTER

lenticels, they are openings for admitting air to the inner tissues. Lenticels are conspicuous in the bark of the birches.

The presence of thorns on the trunk and branches of certain trees helps us to distinguish them from others, and the clusters of dry fruit which remain hanging on some trees through the winter are another means of identification.

Stems and Twigs Stems and twigs vary from the finest, lightest sprays to the most coarsely moulded ones,—from the delicate twigs of the hop hornbeam to the stout shoots of the horsechestnut;—like larger branches their tips either ascend, droop, or grow at right angles from the stem, and may be smooth, downy, or rough to the touch.

The pith in cross sections of twigs shows different forms and is a means in itself of distinguishing some trees. It is usually circular, but in some species it takes the form of a pentagon or a star. In a vertical section we sometimes find it in horizontal plates, like the chambered pith of the walnuts. The color is usually white, but sometimes we find it pink, yellowish, green, red, and brown.

It is interesting to find that the history of a tree for several years past can be told by study-

THE STUDY OF TREES IN WINTER

ing the scars along the bare stems. The annual growth each year is marked by a circle of scars around the stem, which was left by the scales of the buds when they opened in the spring, and these scars mark each season's growth for successive years along the stem.

Leaf-scars Besides these circles of scars, there are scars on each side of the stem which were left by the leaves when they fell in the autumn. These leaf-scars differ distinctly in various species and may be round, narrow, triangular, oval, heart-shaped, or horseshoe-shaped according to the species of the tree. They are either flat upon the stem or on a projection, they are sometimes concave and again convex. They may be opposite each other on the stem, as those of the horsechestnut, maples, and ashes, or the arrangement may be alternate, as that of hickories, walnuts and oaks. The places on the stem where the leaf-scars appear are called *nodes*, and the spaces between the nodes are called *internodes*.

Occasionally stipule scars are found on the stems,—inconspicuous scars left by stipules, the leaf-like bodies found at the base of leaf-stalks on some trees,—and sometimes we find the scars of fruit stalks.

STUDIES OF TREES IN WINTER

Bundle-scars Bundle-scars are the scars of the little fibres, the vascular bundles which fastened the leaves to the stems in summer. They are found on the leaf-scars and usually take their shape more or less. On the large leaf-scars they can be seen clearly, but on delicate twigs where the leaf-scars are small it is well to use a magnifying glass.



BUNDLE-SCARS

Buds In our climate the buds of trees are formed in the summer during the season's growth. The bud at the tip of the stem is called the *terminal* bud, the buds in the axils of the leaf-scars are called the *axillary* or *lateral* buds. Buds contain complete branches in miniature which develop in the spring into a new crop of twigs. By opening a bud in winter the little leaves can be seen and often a cluster of flowers, packed away from the cold in marvellous warm wrappings.

As a rule the terminal bud carries on the growth of the tree and the lateral buds furnish the side branches. Flowers are found in both terminal and lateral buds, but sometimes they are enclosed in buds by themselves which open before the leaves come out in the spring, like those of the red maple and American elm, —

THE STUDY OF TREES IN WINTER

these are called *flower* buds. Occasionally we find two or three lateral buds together called *accessory* buds, — *superposed*, if placed one above another as they are in the butternut; *collateral*, if side by side as in the red maple. When several buds are crowded together one bud usually remains latent. Latent buds are sometimes caught in the growing bark of the tree and remain undeveloped for years, breaking out at length perhaps up and down the sides of the trunk as we see them in “feathered elms.” These abnormal and irregular buds are called *adventitious* buds.

The winter buds of trees may be large or small, they may be slender, flat, oval, pointed or round, hidden or exposed, they may be smooth, downy, sticky, or rough, covered with scales or naked, and they may differ in color from pale yellow to an inky black.

From the great outlines of the trees against the sky to the little scales of the buds on the stems we marvel to find here as in all nature, order, law, consistency out of infinite variety.

CHAPTER II

THE HORSECHESTNUT



HORSECHESTNUT
Æsculus Hippocastanum

Chapter II

THE HORSECHESTNUT

Family Hippocastanaceæ

THIS is a small family consisting of one well-known cultivated species, — the horsechestnut, — and four belonging to the Western and Southern States, — the various large and small buckeyes.

The horsechestnut is so well known and its winter characteristics so clearly marked that I have chosen it first for description, although no species of the family is found growing wild in the Northeastern States.

Horsechest-
nut

*Æsculus Hippocas-
tanum*

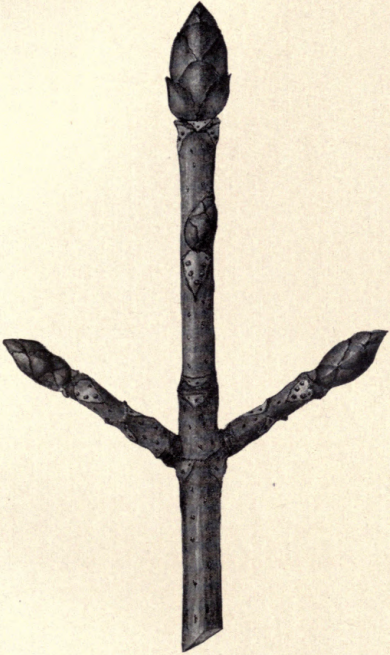
A large tree with a pyramidal head. The bark of old trees splits off in small square pieces, and in young trees it is smooth.

Very coarse twigs and large brown buds covered with a gummy substance. Opposite leaf-scars.

The horsechestnut has little grace or beauty of outline, in winter. Its branches are stiff, the twigs are coarse, ending bluntly with large

STUDIES OF TREES IN WINTER

terminal buds, and the general shape too compact to be pleasing. The buds and recent shoots are particularly interesting however, as every scar is sharply defined and the buds are so large we can see the inner structure perfectly. In the accompanying illustration we see a two-year-old shoot with a large terminal bud and two lateral buds below the ring of scars left by the scales of the terminal bud of the year before. The bundle-scars are plainly seen on the leaf-scars, and above one of the leaf-scars there is a lateral bud ready to develop into a lateral branch when it opens in the spring. The circle of scars at the base of each lateral shoot was left by the scales of the lateral bud of the year before. There are one or two small undeveloped buds at the top of the leaf-scars which would carry on the growth of the branch if anything happened to injure the vigorous buds at the tips of the stems. The dots on the bark are the lenticels. By opening the bud with a knife we find beneath the sticky gummy substance and the numerous layers of scales a complete branch in miniature. The little leaves are carefully packed in downy wool to keep out the dampness and cold, and in their turn they protect the delicate pink spike of flowers. A German naturalist once



HORSECHESTNUT SHOOT

THE HORSECHESTNUT

counted sixty-eight flowers on one of these undeveloped spikes in the bud, and with a microscope he discovered the pollen of the stamens.

The horsechestnut came originally from Southeastern Europe and was introduced into gardens about the middle of the sixteenth century. Its wood has no commercial value. The generic name, *Æsculus*, comes from *esca*, food, the ancient name of an oak with edible acorns; it was probably given to this tree on account of its large chestnut-like fruit. *Hippocastanum*, from *hippos*, a horse, *castanea*, a chestnut, alludes to the fruit which is made into horse medicine in Turkey.

The Ohio buckeye (*Æsculus glabra*) is a shrub or low tree found west of the Alleghanies. Its terminal bud is frequently lacking, and the two upper lateral buds grow large and take its place. Its buds and stems resemble those of the horsechestnut, but the two species would never be confused.



Enlarged longitudinal section of the bud of a horse-chestnut, showing two folded, undeveloped leaves and an undeveloped spike of flowers.

CHAPTER III
THE MAPLES



1. Sugar Maple. 2. Silver Maple. 3. Red Maple. 4. Moosewood.
 5. Mountain Maple. 6. Norway Maple. 7. Sycamore.
 8 A and B. Ash-leaved Maple, showing the varying color of the stems.

Chapter III

THE MAPLES

Family Aceraceæ

MAPLES have long been famous for beauty of blossom in the early spring, and richness of foliage in the late summer and autumn; but a study of the twigs and buds after the leaves have fallen, the varying colors of buds and stems, the delicacy of twigs and branches, and grace of outline as trees demonstrates effectively the unusual beauty of the maples in winter.

The family name *Acer* comes from the Latin word for sharp, which was originally derived from *ac*, a Celtic word meaning a point. The name was given to this genus because the wood was much sought after in ancient times for the heads of pikes and lances.

Among some forty species of maple there are six native species, if the ash-leaved maple is included in this genus. Two species from Europe, the Norway and sycamore maples, are planted commonly throughout New England.

STUDIES OF TREES IN WINTER

All the maples have opposite leaf-scars.

Sugar or Rock Maple
Acer saccharum

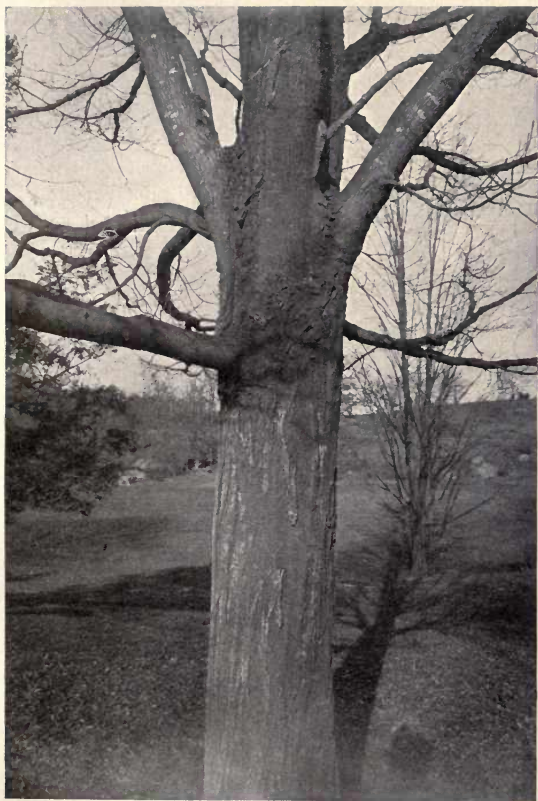
The general shape is erect, with smooth, clean branches. In old trees the bark breaks away in long, shallow fissures with curling ridges, giving the trunk a ploughed appearance. The buds are narrow, brown, and sharp-pointed. Delicate pinkish leaves folded inside the bud. Leaf-scars small and opposite; also the twigs branch opposite each other.

Among the different characteristics of this tree in winter, two stand out conspicuously as unfailing means of identification,—the sharp-pointed brown buds and the rough furrowed trunk with smooth places between the fissures. When young it can be distinguished at a distance by its erect habit of growth and general shapeliness, the main trunk often extending up into the tree unbroken by divisions.

The sugar maple is typically American, and is especially associated in our minds with the farming and country life of New England. It is found in all the Northeastern States growing wild and extensively cultivated. Maple sugar is made from the sap of this tree in the early spring. A clear, bright day and a westerly wind succeeding a frosty night are most favorable to the flow of sap, according to Emerson.



SUGAR MAPLE
Acer saccharum



TRUNK OF A YOUNG SUGAR MAPLE

THE MAPLES

A hole is bored in the trunk of the tree, and the sap flows for about three weeks. It is collected daily in buckets, and then boiled into syrup. A sugar maple should not be tapped before it is twenty-five or thirty years old, but after that age it may be tapped annually as long as it lives. The wood of this tree is hard and smooth, and is much used for furniture and the interior finishing of houses. Occasionally a tree is found where the fibres of the wood are contorted irregularly into round points called bird's eyes. The cause of this peculiar bird's-eye maple is unknown, and the theory that the grain is diverted by the tapping of woodpeckers for the sweet sap is an unsatisfactory explanation, for some trees are thickly covered, while others do not have a single spot.

The Latin name, *Acer saccharum*—sugar maple—came from the Arabic, *Soukar*.

Red or Swamp Maple
Acer rubrum

A low tree, with a rounded head, smooth gray bark, reddish twigs dotted with brown, and small, round red buds with smooth scales. When old the bark cracks and peels off in long, slender flakes. Small leaf-scars opposite each other on the stem. The flowers come before the leaves, from the round flower buds clustered around the stem.

STUDIES OF TREES IN WINTER

Even in the middle of winter the red maple is true to its distinctive characteristic of color, and one marvels to find so much red in its buds and twigs. The gray trunks are in fine contrast, and accentuate the color, and the curving tips of the branches, with their delicate twigs and graceful outlines, give the trees great beauty.

The red maple is one of the very first trees to bloom in the early spring, and then its color is conspicuous, for, as Lowell says, it "crimsons to a coral reef." The flowers are sweet scented, and the carrying of pollen is done on a wholesale plan over the tree by little, inconspicuous insects, which carry the pollen dust from flower to flower.

In the autumn this tree is one of the first to turn, and its brilliant red leaves in the low swamp lands, beginning often the last of August or early September, invariably startle one with a swift premonition of winter. "How early the fall has come this year!" some one usually says, and no one realizes it is just the habit of early maturity peculiar to that particular red maple. It is a tree closely associated with Thoreau, for we read that he spent much time in extracting sugar from its sap, against the wishes of his more practical-minded father,



RED MAPLE

Acer rubrum



TRUNK OF A YOUNG RED MAPLE

THE MAPLES

who could not understand why his son should spend time and money over such an experiment, when he could buy better and cheaper sugar at the store.

The wood, although it is close-grained and firm, is not so much used as that of the sugar maple, owing to the fact that it decays when exposed to alternate moisture and dryness. There are several varieties of the wood. The curled maple, one of the most attractive, has wavy fibres which catch the light like watered silk, and it is much used in cabinet work. The sap is only half as rich in sugar as that of the sugar maple.

The Latin name, *Acer rubrum*, — red maple, — came from the Celtic word *rub*, signifying red.

White or Silver Maple *Acer saccharinum* *This tree is found growing wild in wet places throughout New England, and it is also often cultivated. The trunk is low and divided into spreading branches that form a spacious head. The branches sweep down and turn up with curving tips. Smooth, red buds like those of the red maple. It blossoms before the leaves are out, like the red maple.*

It is always a delight to find this tree growing naturally where it has not been planted, for, owing to its habit of growing near flowing

STUDIES OF TREES IN WINTER

streams with clear, sandy bottoms, one rarely comes across it. It is a tree to look for on a canoeing trip, and when one discovers its long, drooping branches hanging over the stream, the feeling of isolation is complete; a silver maple on a river bank accentuates the sense of being in the country, just as the notes of the hermit thrush accentuate the sense of remoteness in the woods.

In winter there are two distinct characteristics by which one may distinguish the silver maple from the red which it closely resembles, — the curving tips of the lower branches which sweep down and curve up in a pronounced way unlike the red maple, and the manner in which the bark peels off from the old trunks, in long pieces which are free at either end and attached in the middle, while the bark of the red maple splits up and down the trunk without shagging in strips.

The wood of the silver maple is soft and perishable and is seldom used.

The former name of this tree was *Acer dasycarpum*, but it has been changed to *Acer saccharinum*, the old name for the sugar maple, — *Acer saccharum*.

It is found growing wild along river banks



SILVER MAPLE
Acer saccharinum

THE MAPLES

from New Brunswick to Florida, and it is frequently planted in cities and towns.

Striped Maple; *A small tree, with smooth green shoots and a light green bark*
Moosewood *striated with white. The leaf-scars are opposite, and encircle the stem, and are conspicuously ridged, with two raised lines above. Smooth bud-scales, silver white leaves folded within the bud.*
Acer pennsylvanicum

The moosewood is a beautiful little tree at all times, but in winter when its large leaves have fallen and the wonderful coloring of its trunk and stems is no longer concealed by foliage, one can fully appreciate its color, delicate branches and smooth stems. The trunk is an exquisite shade of green, smooth, with occasional stripes of white, and the stems and buds are also smooth and a rich rose in color.

This tree is too small for practical use, but its æsthetic qualities should cause it to be more generally planted in our parks and gardens than it is.

The name moosewood was given to it by the country people in Maine, as the moose in the woods invariably strip it for the sweet juice in the tender young shoots in winter, when there is little for them to eat.

STUDIES OF TREES IN WINTER

The Latin name *Acer pennsylvanicum* — Pennsylvanian maple — was given to it by Linnæus.

The moosewood is found throughout the North Atlantic States growing in rich woods under taller trees.

Mountain Maple
Acer spicatum This is a shrub about eight feet high, found commonly in the mountains and hills of New England, and like the moosewood seldom found growing out of the forest. It is easily distinguished by its gray bark and pink stems covered with a delicate gray bloom, and the clusters of dried fruit left hanging on the stems.

Acer spicatum — spiked maple — refers to the spike-like clusters of flowers.

Ash-leaved Maple ; Box Elder
Acer Negundo *A small or medium-sized tree with yellowish green or reddish brown smooth stems and opposite V-shaped, narrow leaf-scars.*

The buds are gray and downy and covered with two pairs of scales.

This tree is found wild in Vermont and Pennsylvania, southward and westward in lowland woods, and is more or less cultivated throughout New England.

It is not long-lived and has small practical



MOOSEWOOD MAPLE

Acer pennsylvanicum

THE MAPLES

value, as the wood is not strong, and the sap yields only a small quantity of sugar.

The Latin name, *Negundo*, is meaningless and its origin is unknown.

Norway Maple *A tall tree, with a round head and closely fissured bark. The buds are large, round, and a dull reddish brown color. Coarse twigs and opposite leaf-scars. Distinctive characteristic is the white juice which comes after cutting off a bud.*
Acer platanoides

It is particularly interesting to open the buds of this tree, and to see how carefully the leaves are protected. After removing the outer scales of the terminal bud with a knife, one discovers a pair of scales covered with soft brown hair as thick as sealskin fur and the same color. Within this warm covering there are still another pair of inner scales with fur a little darker and thicker than that of the first pair, and within these are the little leaves in embryo. In some buds one finds a tiny flower cluster instead, so small it can scarcely be seen, but perfect in every detail, — the most protected of flowers. A discovery like this makes one wonder if the dispensation of coverings is erratically bestowed, for why should we find a rugged, stalwart tree like the Norway maple with its buds luxuriously protected from the cold, while

STUDIES OF TREES IN WINTER

a slender, delicate tree like our moosewood has only a pair of scales for a bud-covering? There must be hidden vitality in the little moosewood, for in spring, when the leaves come out, they are as vigorous and beautiful as those of the Norway maple; perhaps, after all, it is just a matter of nationality; the Norway maple came from Europe and has kept the traditional custom of wearing warm clothing in winter, and the moosewood has lived without superfluous raiment, like an Indian in the woods.

Sugar has been made from the sap of the Norway maple, but it is produced in small quantity. The wood is easily worked, and is used in Europe for various small purposes.

Acer platanoides means platanus-like maple, and refers to an imaginary resemblance to the plane tree.

Sycamore	<i>A tall tree, with a spacious head.</i>
Maple	<i>The bark breaks off in thin</i>
<i>Acer Pseudo-Platanus</i>	<i>plates. Coarser twigs than those</i>
	<i>of the other maples, leaf-scars opposite, and large</i>
	<i>round buds. Distinctive characteristic is its</i>
	<i>green buds, which are green all winter.</i>

This is the "sycamore tree" of Europe, and it is found here commonly planted in gardens and along roadsides.



NORWAY MAPLE
Acer platanoides

THE MAPLES

It is distinguished from all other maples in winter by its unvarying green buds, and the manner in which the bark of old trees breaks off in thin, small, square pieces.

It is a favorite Scotch tree and was much planted about old estates in Scotland. Over two hundred years ago, the powerful barons in the West of Scotland used these sycamores for hanging their enemies and refractory vassals on, and these trees were called dool, or grief trees. Loudon tells the romantic histories of several dool trees which were still standing in 1844.

The wood is used in Europe for toys and other small articles, and experiments have been made with the sap, and sugar has been obtained in small quantities.

The name *Pseudo-Platanus* — false plane — was given to it on account of a fancied resemblance to the plane tree.

It is the intention of the author to publish in
 volume of the *Journal of the Royal Society* and the
 number in which the book of all these papers
 will be published.

It is a pleasure to state that the author has
 planned to publish the book in London. The
 two papers were given at the meeting of the
 Royal Society at the Royal Institution on the
 10th of December 1880. The author has
 been very much gratified by the interest
 which has been shown in the papers and
 has been advised to publish them in a
 separate volume.

The book is now in the hands of the
 printer and will be published in London
 in the month of January 1881. The
 author has the pleasure to announce that
 the book will be published in London.

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SYCAMORE MAPLE

Acer Pseudo-Platanus

CHAPTER IV
THE ASHES



1. Red Ash. 2. White Ash. 3. Black Ash. 4. European Ash.

Chapter IV

THE ASHES

Family Oleaceae

IN winter there is little to attract us in ash trees beyond a certain bold strength of trunk and limb. There is no grace or delicacy whatever in the branches, the twigs are coarsely moulded, and the buds are thick and leathery. The popular prejudice existing against ash trees in summer, when the contrast of their light foliage and heavy trunks makes it less deserved, is fully warranted in winter; but if the ash is ugly, the wood of few trees is as generally useful, and its literary history dates back to the "Odyssey" and to the Eddas of Norse mythology.

The generic name, *Fraxinus*, comes from the Greek *phraxis* (separation), and probably alludes to the wood of the European species which splits easily. There are about fifteen different species in the United States, three of which are found commonly in New England. The

STUDIES OF TREES IN WINTER

green ash, which used to be considered a distinct species, is now thought to be a variety of the red ash.

All the ashes have opposite leaf-scars.

**White or
American Ash** *Fraxinus americana* *A large tree with a straight trunk. Bark furrowed with irregular ridges, the hollows forming diamond shapes frequently. Buds smooth, thick and hard like leather, and a rusty brown color. Twigs smooth, without down. Leaf-scars opposite, and the stems are flattened at the nodes. Cross-shaped branching of the twigs against the sky.*

The white ash is a tree which we find frequently along roadsides and in the woods everywhere in New England. The characteristics which distinguish it from other trees in winter are the close diamond-shaped fissures of the bark, the rusty brown buds, and often the old clusters of paddle-shaped fruit hanging on the tree. On some ash trees black, berry-like excrescences are found hanging in dry clusters on the ends of the branches. These are not clusters of fruit, as might at first be supposed, but the diseased and undeveloped remains of the panicles of staminate flowers which have been injured by mites,—curious freaks resembling oak-apples and the outgrowths of other



AMERICAN ASH
Fraxinus americana

THE ASHES

insect poisoned plants. Occasionally these berry-like clusters have been gathered as seeds, by mistake, instead of the true fruit, a mistake which does not seem remarkable when the fruit-like appearance of the clusters is considered.

The wood of the white ash is heavy, tough, and strong, and is much used for agricultural implements, tool handles and oars, for the interior finish of houses and in the construction of carriages. Emerson tells of an ash which was felled in Granville many years ago, the wood of which furnished three thousand rake stalks. The tree from which I took the following photograph, stands on a farm in Sterling, Massachusetts, and measures over fourteen feet in circumference, five feet from the ground. This trunk illustrates the massive strength which gives the ash its one æsthetic quality.

Red or Downy Ash

*Fraxinus pennsyl-
vanica*

This tree resembles the white ash, but is distinguished from it by the down on the recent shoots. It is a smaller tree than the white ash, more spreading in shape. The twigs are less coarse and branch more frequently, with less space between the buds,—shorter internodes,—on shoots of the same age. Buds inconspicuous, smaller and blacker than those of the white ash. Bark closely fur-

STUDIES OF TREES IN WINTER

rowed, like that of the white ash. Leaf-scars opposite.

The red ash is much less coarsely moulded than the white ash, and in its leafless season, particularly, the contrast between its branches and those of the white ash is plainly seen. The fissures in the bark of the red ash seem a little finer and nearer together than those of the white ash bark on trees of the same age. The soft down on the recent shoots remains through the winter; and this, with the finer twigs, which branch more frequently, and the smaller, darker buds, makes the tree easily distinguished from the white ash in winter,—more easily even than in summer.

The staminate flowers of the red ash are afflicted by mites in the same way as those of the white ash, producing unsightly clusters which hang on the tree all winter.

The wood is much less valuable than that of the white ash.

Black Ash *A slender tree, 40 to 70 feet*
Fraxinus nigra *high. Trunk dark gray, often*
disfigured with knobs. The buds are black,
and the young shoots greenish. Coarse twigs;
opposite leaf-scars.

The black ash is distinguished from the white and red ashes by its darker buds and by

THE ASHES

having a less pinched, flattened appearance at the nodes on the stem. It grows throughout New England in swamps, in wet woods, and in moist, muddy ground near rivers. In the woods its trunk is found frequently without branches to a great height, and Emerson calls it the most slender deciduous tree to be found in the forest. It is sometimes seventy or eighty feet high, with a trunk scarcely a foot in diameter.

The wood of the black ash is heavy but not strong. It is used for fences, for the interior finish of houses, and, after being separated into thin strips, it is used in making baskets and the bottoms of chairs. Its sap was an old remedy for earache, obtained by holding a green branch before the fire.

The specific name, *nigra*, refers to the color of the buds.

European Ash
Fraxinus excelsior

A large tree, with a lofty, spreading head and short, thick trunk.

The bark is ash-colored when old, and dark gray when young. Very black buds distinguish it from the American species. Opposite leaf-scars.

The European ash is planted frequently along roadsides and in our parks and gardens. It is indigenous to Northern, Central, and Southern

STUDIES OF TREES IN WINTER

Europe. Its jet black buds distinguish it from other ash trees. In the chapter called "A Visit to an old Bachelor," in Mrs. Gaskell's "Cranford," Mary Smith tells us how she was talking to Mr. Holbrook in the fields, and how he quoted poetry to himself and enjoyed the trees and clouds and glimpses of distant pastures, and how he suddenly turned sharp round and asked, "Now, what color are ash buds in March?"

"Is the man going mad? thought I. He is very like Don Quixote. 'What color are they, I say?' repeated he vehemently. 'I am sure I don't know, sir,' said I, with the meekness of ignorance. 'I knew you didn't. No more did I—an old fool that I am!—till this young man comes and tells me. Black as ash buds in March. And I've lived all my life in the country; more shame for me not to know. Black: they are jet black, madam."

The "young man" he refers to is Tennyson, and the quotation, "Black as ash buds in the front of March," is a simile used in "The Gardener's Daughter," and it shows how acute Tennyson's powers of observation were, and how true his descriptions of nature.

The buds of the ash open later in the spring than those of other trees, and the leaves unfold

THE ASHES

very slowly. Tennyson also noted this characteristic: —

“Why lingereth she to clothe her heart with love,
Delaying as the tender ash delays
To clothe herself, when all the woods are green?”

The rare fitness of this simile might pass unheeded if we did not study trees first and poetry afterwards.

In Europe ash seeds were used for medicine. They were called *lingua avis* by the old apothecaries, on account of a fancied resemblance to the tongues of birds; young ash seeds were also pickled and used in salads. Evelyn says the wood “is of all others the sweetest of our forest fuelling, and the fittest for ladies’ chambers.”

The horsechestnuts, the maples, and the ashes are the three genera of large trees which have opposite leaf-scars.

CHAPTER V

THE WALNUTS AND HICKORIES



1. Butternut. 2. Black Walnut. 3. Pignut Hickory. 4. Mockernut Hickory. 5. Shagbark Hickory. 6. Bitternut Hickory.

Chapter V

THE WALNUTS AND HICKORIES

Family Juglandaceæ

FEW trees are more lofty and majestic than certain species of walnuts and hickories. They are stately in summer, but in winter, when the foliage has gone and every branch and twig is thrown in black relief against the sky, their beauty is truly imposing.

Both walnuts and hickories are valuable timber trees, and the nuts of several species are sweet and edible.

Two genera of this family are found in America, — *Juglans* and *Carya*. Of the first genus there are two species native in the North-eastern States,—the butternut and the black walnut.

Butternut *A low, spreading tree, branching*
Juglans cinerea *a short way up the trunk. Gray*
bark, slightly fissured, the clefts not running to-
gether. Recent shoots downy, with a fringe of

STUDIES OF TREES IN WINTER

hair over the leaf-scar. Leaf-scars conspicuous, alternate, the bundle-scars horseshoe (U) shaped. Light brown buds destitute of scales. Terminal bud encloses pistillate flowers, which are fertilized by the staminate flowers enclosed in the pineapple-like bud over the leaf-scars. These staminate flowers hang in one long catkin, which drops off after shedding the pollen in spring. The superposed buds (two or three over the leaf-scars) contain the side branches. Pith light brown and chambered,—by cutting a twig lengthwise this can be seen,—a characteristic of the *Juglans* family.

Among all the native trees, the butternut is perhaps the most interesting for winter study. The naked buds, the irregular leaf-scars, with horseshoe bundle-scars, the superposed buds containing the lateral branches and the queerly marked buds of the staminate flowers, the chambered pith, and the little fringes of down on the stems, every structural detail of this tree is interesting and unusual. The butternut is one of the few trees among the *Juglandaceæ* which is not tall and beautiful in outline. It is a low tree, with wide-spreading, rather straggling branches, frequently ill shapen and uncouth in appearance. It is usually associated in our minds with country lanes, and growing



BUTTERNUT
Juglans cinerea



TRUNK OF A BUTTERNUT

THE WALNUTS AND HICKORIES

by the walls and fences bordering open pastures and farm lands, and in these surroundings it seems pleasing and appropriate; but when we find it planted in parks and cultivated grounds it seems commonplace and insignificant. It is found in all the New England States, in New York, and in Pennsylvania. Very large specimens grow in the valley of the Connecticut River.

The wood of the butternut is light brown in color, it is light, soft, and easily worked, and is much used for furniture, gunstocks, and for the interior finish of houses. The inner bark is used medicinally, and a dye is made from the bark and nutshells. An excellent pickle is made from the young nuts, and the kernels are sweet and edible, although rather rich and oily. Professor Gray tried the experiment of making sugar from the sap of the butternut. He found that it took four trees to yield nine quarts of sap (one and a quarter pounds of sugar), the amount that one sugar maple yields.

The generic name, *Juglans*, comes from *Jovis glans*, the nut of Jove, in reference to the excellence of the fruit, and the specific name, *cinerea* (ash-colored), probably alludes to the color of the bark.

STUDIES OF TREES IN WINTER

Black Walnut *Juglans nigra* A large tree, 50 to 120 feet high, with spreading branches and rough bark, darker in color than that of the butternut. The buds are gray instead of light brown like those of the butternut, and they are shorter. The twigs are smooth in winter, without hair, and the pith is chambered. Alternate, conspicuous leaf-scars. Characteristic difference between the two trees is that the fringe of hair over the leaf-scar in the butternut is absent in the black walnut.

The black walnut is a striking contrast to the butternut. It is tall and erect, with a broad, spacious head and vigorous, wide-spreading branches. The bark is much darker and rougher than that of the butternut, and the buds are smaller, and gray rather than yellowish in color, like those of the other species.

The wood is heavy, strong, and durable, and dark brown in color. It takes polish well and is much used in cabinet making, boat-building, interior house finishing, and for gunstocks and coffins. A valuable wood in many ways, but the passing of the fashion for black walnut furniture is not to be regretted. It has been cut most recklessly in our forests during the last twenty-five years, and already it has been almost exterminated in the Mississippi Basin.



BLACK WALNUT
Juglans nigra



TRUNK OF A BLACK WALNUT

THE WALNUTS AND HICKORIES

Individual trees are now sold where there used to be whole tracts of black walnut forests. In Tennessee last year, dealers were buying stumps of old walnut trees which had been left when the trees were first cut, in the early days of the lumber trade. Each stump brought more money than the whole tree originally sold for.

Its fruit is edible, and an oil is made from its kernels. A kind of bread has also been made from the kernels of these nuts, and the husks are used as a dye.

The black walnut is found growing wild in the Northeastern States, but it is more common west than east of the Alleghanies.

The English walnut, *Juglans regia*, originally came from Persia, and is sometimes cultivated here. An interesting cross between the English walnut and our native butternut is found on the north side of Houghton's Pond in the Blue Hills, Massachusetts. Only a few of these hybrids are known to exist, and all of them are said to grow in the vicinity of Boston.

Shagbark ; or	<i>A tall, stately tree, 70 to 90 feet high; unmistakable on account of its rough, flaking bark, which shags off in large plates. Yellowish brown buds, with two outer dark scales, which also shag characteristically. Coarse twigs;</i>
Shellbark	
Hickory	
<i>Carya ovata</i>	

STUDIES OF TREES IN WINTER

alternate leaf-scars. The husk of the nut splits and breaks off.

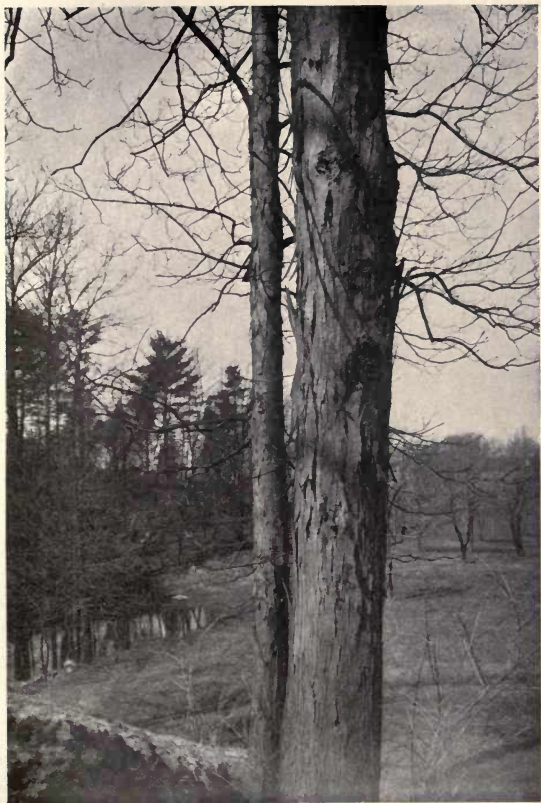
This is a tree peculiar to Northeastern America, and one of the most rugged, magnificent specimens to be found anywhere in the same temperate climate. It is especially adapted for broad treatment in landscape gardening; and should be planted where there is plenty of room for its full development, and where one can admire its lofty proportions and symmetry. It is one among many trees, which is seen at its best in winter unhampered by foliage, and then its naked boughs are so inky black, that it seems as if it were etched against the sky. These very dark colored branches are characteristic of the hickories, and help one to distinguish the trees at a distance. The rough bark shagging off in curving plates, and the buds with the same shagging, curving outer scales are the distinctive characteristics of the shagbark in winter.

The wood is heavy, hard, tough, and close-grained, and it is used for agricultural implements, axe handles, wagon stock, walking sticks, and baskets. In tensile strength and in the weight of compression, a block of hickory is as strong as wrought iron of the same length and weight. No other American



SHAGBARK HICKORY

Carya ovata



TRUNKS OF SHAGBARK HICKORIES

THE WALNUTS AND HICKORIES

wood burns with such brilliancy or gives out so much heat as the shagbark. The fruit of this tree is edible and sweet, and the nuts have greater commercial value than those of any other hickory.

The former name, *hicoria*, was of Indian origin and came from *powcohicora*, the name of an oily emulsion made from the pounded kernels of mockernuts by the Virginian Algonkians. *Ovata* (egg-shaped) refers to the shape of the leaves.

The shagbark is found from Southern Maine to Florida and westward to Central Kansas. The forests of Indiana, once the centre of the hickory trade, are now exhausted. The hickories are confined to Eastern North America alone, and are a genus of rare and very valuable trees.

Mockernut; or
Whiteheart
Hickory
Carya alba

A tall tree 60 to 100 feet high, with a lofty head. Bark smooth, with close, wavy furrows,—a distinctive characteristic of the tree. Large, hard, round buds, without the dark outer scales peculiar to the shagbark, but with downy, yellowish brown scales. Coarse twigs; alternate leaf-scars. Nut somewhat hexagonal, with a very thick shell, and a hard, thick husk.

The mockernut is one of the most interest-

STUDIES OF TREES IN WINTER

ing of the hickories in winter. Its bark has a peculiar wavy appearance, entirely unlike any other member of the family. The hollows are close together in sinuous, shallow furrows, and the bark is so smooth over these fissures that it looks as if the ridges were trying to grow over and close up the hollows,—the effect is that of a thin, silk veil drawn over the trunk. The twigs are large and heavily moulded, with large oval buds, but they produce a pleasing effect of strength, instead of seeming ugly and coarse, like those of the horsechestnut. The curves and irregularities the stem takes in growing, and the general alternate plan of branching save the mockernut from being rigid and upright like the horsechestnut.

The mockernut is easily distinguished from every other hickory by its peculiar bark, its smooth, large buds, and coarse stems.

Its wood is used for the same purposes as that of the shagbark and is equally valuable. Its nut is large and sweet, and if the tree were put under cultivation, it would probably equal that of the shagbark in commercial value. As it is now, however, the shell is too thick, hard, and difficult to crack, and the kernel too small in proportion to the shell to make it marketable. The experiment of cultivating the mock-



MOCKERNUT HICKORY
Carya alba

STUDIES OF TREES IN WINTER

scarcely a lapse of time when they fail to distinguish the tree. The bitternut is the most graceful of all the hickories. It has a smooth, tapering trunk and delicate twigs.

Its wood is heavy, hard, tough, and close-grained, and is used for the yokes of oxen for hoops and fuel. The nuts are so bitter that squirrels refuse them as food.

The former name, *minima* (the smallest), referred to the branches and foliage of the tree, which are more delicate than those of other hickories. The range is the same as that of the shagbark and mockernut.

Pignut Hickory *A large tree, 70 to 80 feet high*
Carya glabra *with a tapering trunk and smooth*
gray bark, which does not shag. The buds are
yellowish brown, and smaller than those of
other hickories, with no black outer scales like
those of the shagbark, and smaller than the
mockernut buds. The buds are either round, or
egg-shaped. Delicate twigs; alternate leaf-scars.
The nut has a thick shell and poor kernel; the
husk does not split all the way down as it does
with the shagbark.

If it were possible for trees to have negative characters the pignut would be eminently negative. In fact its distinguishing characteristic is that it has no one distinctive feature to iden-



BITTERNUT HICKORY
Carya cordiformis

THE WALNUTS AND HICKORIES

tify it in winter, as all the other hickories have. Its bark is not wavy like the mockernut, and it does not shag like the shagbark; its buds are not yellow like the bitternut, nor large like the mockernut, nor has it black outer scales like the shagbark; its nuts are neither bitter nor sweet,—and yet these very negative qualities are a sure means of identification. One knows the pignut in much the same way that David Harum knew he had bought a horse, “the only thing to determine that fact was that it wa’n’t nothin’ else.” All praise, however, to the outline of the pignut against a winter sky. The tracery of its twigs and branches is delicate and graceful, and it looks as if it were drawn with the blackest India ink. Michaux calls the pignut one of the largest trees in the United States, and it certainly compares well with the three other native hickories in its general bearing, for it is as stately and beautiful in outline as they, in spite of its negative characteristics in details.

The wood is like that of other hickories and it is used for the same purposes. The nuts vary much in shape and size. Some of them are oval, others broader than they are long, others perfectly round, and the sizes vary as much as the shapes. The nuts are not market-

STUDIES OF TREES IN WINTER

able, although they are not unpleasant to the taste and afford squirrels a supply of food for winter.

The specific name, *glabra* (smooth), refers to the shoots and leaves, which are smoother than those of other hickories.

The range of the pignut is the same as that of other members of the genus; it is found throughout New England and in the West and South.



PIGNUT HICKORY
Carya glabra

CHAPTER VI

THE BIRCHES, HOP HORNBEAM,
AND HORNBEAM

CHAPTER II

THE BIRKENHEAD HOSPITAL
AND SURGERY



CANOE BIRCH
Betula papyrifera

Chapter VI

THE BIRCHES, HOP HORNBEAM, AND HORNBEAM

Family *Betulaceæ*

THE birches are a family of exceedingly graceful and attractive trees, and charm us quite as much in winter by the color of their stems and the delicacy of their twigs, as they do in summer by the fresh green of their foliage. Like other trees, birches vary in appearance according to the place where they grow. If they are shaded by other trees in the woods their trunks are tapering and tall and free from branches, but when they grow in open fields and the lateral branches develop, their general outline is bushy and far less attractive; unlike other trees, birches are improved by not having full development.

The birch has been known from the earliest ages, and it is found in Europe, Asia, and North America.

There are distinguishing characteristics in the details of buds and stems, but the color

STUDIES OF TREES IN WINTER

and texture of the bark on the trunk and branches of the different species are the most obvious and certain means of identification in winter.

There are in all six native species in New England, and one from Europe which is planted in our parks and gardens.

Canoe, Paper
or White

Birch

Betula papyrifera

A large, graceful tree, 60 to 75 feet high, with wonderfully white bark splitting into thin, tough layers. Branches thicker, buds larger, catkins larger than those of other birches, and the upper part of the twigs is hairy. The buds are sticky and greener inside than those of other birches,—less silvery and soft. The leaf-scars are alternate.

In winter, as at every other season of the year, few trees surpass the canoe birch for beauty and delicacy. No other tree has a bark so shinningly white, and even the snow is unable to dim its purity. We usually think of this tree as being fragile and delicate, especially when we recall it as it grows along the edge of woodlands where the shade of other trees has forced it to grow slender and tall in reaching for the light. The canoe birch is really a large tree, however, and often grows to an enormous size among the northern hills where



GRAY BIRCHES
Betula populifolia

THE BIRCHES AND HORNBEAMS

it seems to thrive best. The feminine characteristics associated with this tree in our minds—"Most beautiful of forest trees, the Lady of the Woods," etc.—receive a curious shock when we come suddenly upon a huge old birch growing in a clearing in the woods, for all the world like a middle aged and corpulent matron among the younger trees.

The wood of the canoe birch is light, but it is hard and strong. It is used for making shoe lasts and shoe pegs, spools, wood pulp, and for fuel. The Indians use it for making sledges, paddles, the frames of snowshoes, and the handles of hatchets. They also use the bark for making canoes, wigwams, and baskets, and they make a drink from the sap of the tree.

The generic name, *Betula*, probably comes from the Celtic name for the birch, *betu*, or it may possibly have come from the Latin *batuere*, in reference to the birch rods with which the Roman lictors drove back the crowds of people. The specific name, *papyrifera*, refers to the paper-like bark which peels off in thin lateral strips.

This birch is found in the mountains of New England and generally throughout the Northern and Northwestern States.

STUDIES OF TREES IN WINTER

**American
Gray or White
Birch**
Betula populifolia

A small, slender tree, 15 to 30 feet high, with an erect trunk. It grows in poor soil and is found growing commonly along sandy roadsides. Several shoots spring from the trunk near the ground. Bark close fitting, with a chalky white surface. Black triangular spaces below each branch. The ends of the twigs are very rough to the touch. Alternate leaf-scars.

This little birch is perhaps the least interesting member of a most attractive family. It is found commonly growing along the sandy banks of country roads and in waste, barren places where pitch pines and blueberry bushes and scrub oaks are found. It is invariably associated with sterility in our minds, and seems to demand nothing of the soil on which it grows, adapting itself immediately to its surroundings, and thriving where other trees would die.

Although the bark is white and might be confounded with that of the canoe birch at first sight, the trees can easily be told apart. The gray birch has a close-fitting bark which is dirty white in color, with triangular black blotches under the branches, it is exceedingly chalky to the touch and never peels off as it



BLACK BIRCH
Betula lenta

THE BIRCHES AND HORNBEAMS

grows old, while the bark of the canoe birch peels off in thin lateral strips, is clear white in color, and seldom shows any dark blotches on the trunk. The bark of the recent shoots of the gray birch is rough to the touch, and that of the canoe birch is smooth and sticky where the buds join the stem.

Its wood is soft, light, and neither strong nor durable. It is used for wood pulp, shoe pegs, spools, barrels, and for fuel.

The specific name, *populifolia* (poplar-leaved), refers to the leaves which quiver in the wind and show light under surfaces like the aspens. The gray birch is found throughout the North-eastern States.

Black or Sweet Birch *Betula lenta* *A tall, round-headed tree. The branches twist in different directions, but are pendulous and graceful. The young shoots are brown, dotted with white, and smooth. The bark is smooth, dark brown, and resembles that of the garden cherry. The buds are conical and pointed. The twigs have an aromatic taste. Alternate leaf-scars.*

Few trees deserve greater appreciation than the black birch and few receive as little from people in general. It is always beautiful, but in winter when the smooth golden brown stems are bare and the sun strikes it squarely, it

STUDIES OF TREES IN WINTER

glows to the tip of the smallest branch with a wealth of radiant, living color.

The black birch is easily distinguished by the dark color of its bark, which is smooth on young trees and cracks into rough square plates on old trees, but which never peels off in strips. Its gray stems have a sweet, spicy taste, which is also a means of identifying the tree.

The wood is heavy, strong, and hard, and its surface after being polished is like satin. It is much sought after for furniture and is excellent for fuel. An oil made from the wood is used medicinally and as a flavoring extract, and a sweet beer is made by fermenting the sugary sap.

The specific name, *lenta* (pliant), refers to the flexible stems and branches of this tree. The black birch is found in rich woods throughout the Northeastern States.

Yellow Birch *Betula lutea* A beautiful straight tree, 50 to 90 feet high. Distinguished from the black birch by its yellowish or silver-gray bark, which, unlike the brown bark of the black birch rolls back and peels off in thin, filmy strips from the trunk. The bud scales overlap each other. Alternate leaf-scars. Delicate twigs with an aromatic taste, not as sweet



YELLOW BIRCH
Betula lutea

THE BIRCHES AND HORNBEAMS

as the black birch. The catkins are larger round than those of the black birch.

This is in every way a worthy sister tree of the black birch, and the rich yellow of the trunk, but partially revealed through the gray, shaggy, outer layers of the bark, is quite as beautiful as the rich red-browns of the black birch bark. Thoreau felt the charm of yellow birches. In his journal, Jan. 4, 1853, he says: "To what I will call Yellow Birch Swamp, E. Hubbard's in the north part of the town, . . . west of the Hunts' pasture. There are more of these trees in it than anywhere else in the town that I know. How pleasing to stand near a new or rare tree; and few are so handsome as this: singularly allied to the black birch in its sweet checkerberry scent and its form, and to the canoe birch in its peeling or fringed and tasselled bark. The top is brush-like, as in the black birch. The bark an exquisite . . . delicate gold color, curled off partly from the trunk with vertical clear or smooth spaces, as if a plane had been passed up the tree. The sight of these trees affects me more than California gold. I measured one five and two-twelfths feet in circumference at six feet from the ground. We have the silver and the golden birch. This is like a fair flaxen-haired sister of

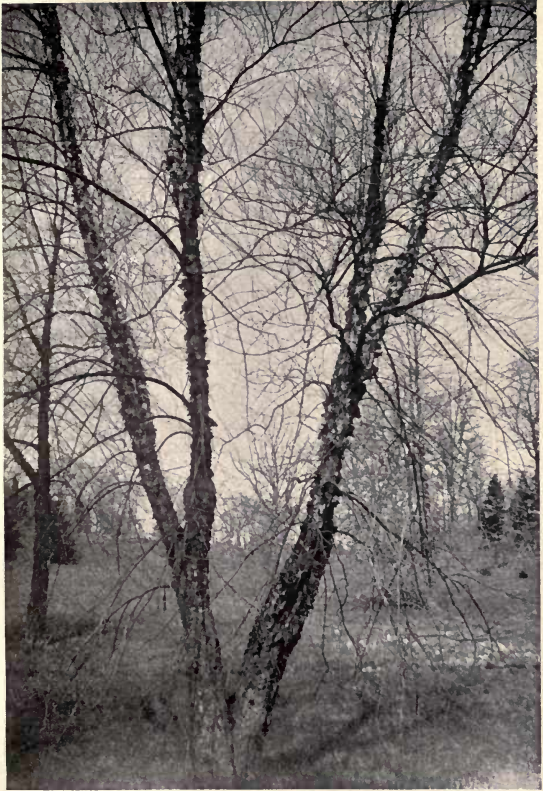
STUDIES OF TREES IN WINTER

the dark complexioned black birch, with golden ringlets. How lustily it takes hold of the swampy soil and braces itself. In the twilight I went through the swamps, and the yellow birches sent forth a yellow gleam which each time made my heart beat faster. Sometimes I was in doubt about a birch whose vest was buttoned, smooth and dark, till I came nearer and saw the yellow gleaming through, or where a button was off."

The yellow birch is one of the most valuable timber trees of the North. The wood is heavy, hard, and strong, and is used for making furniture, the hubs of wheels, and boxes. Few hard woods of a light color make as attractive flooring as polished yellow birch.

The specific name, *lutea* (yellow), refers to the color of the wood and bark of the trunk. The yellow birch is found throughout the Northeastern States.

**Red or River
Birch**
Betula nigra *A medium-sized tree found on the edges of streams. Long, graceful, sweeping upper limbs, with small, pendulous lower branches. The bark is reddish, very shaggy and loose, flaking off and rolling back in thin strips. Alternate leaf-scars. Twigs reddish brown and pliant.*



RED BIRCH
Betula nigra



THE BIRCHES AND HORNBEAMS

The red birch is easily distinguished from all the other birches by its reddish, loosely peeling bark, which gives the trunk an unkempt, shaggy, and torn appearance. The outer bark separates into flakes which are loose at one end and adhere to the trunk at the other, and these projecting strips look like a fringe. The lower branches often bend down towards the ground in a straggling, irregular fashion, while the upper branches are free and sweeping. It should not be inferred from this description that the red birch is lacking in beauty, for it is a most attractive tree. Its general outline is picturesque, and the soft red color of the peeling epidermis of the bark in the upper branches has a very pleasing effect. The red birch is the only semi-aquatic species among the birches, and its drooping branches hanging over the water add much to the beauty of our streams and rivers.

Its wood is light but strong, and is used for furniture, wooden ware, and yokes.

The specific name, *nigra* (black), was given it by Linnæus, the celebrated Swedish botanist,—it seems to have no particular significance.

The red birch is found growing on the banks of the Nashua and Merrimac Rivers and beside smaller streams in Massachusetts, but it grows

STUDIES OF TREES IN WINTER

more frequently along river banks in the South than in the North.

A small shrub (*Betula pumila*), the dwarf birch, found in rocky pastures in Western Massachusetts, Connecticut, and in the South and West, completes the list of our six native birches.

European White Birch <i>Betula alba</i>	<i>A tree from Europe, extensively cultivated in this country. White, chalky bark. Long, slender, down sweeping branches. Small buds. Alternate leaf-scars.</i>
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The slender, drooping branches of the European white birch are so long and pliant that the slightest breeze sets them swaying in one direction from the trunk, like a shower of rain driven by the wind. The birch does not lose its pendulous grace in mere limp dejection, like most of the weeping varieties of trees that gardeners love to propagate, but it holds its head high and the slender branches droop down,—a striking contrast to the weeping willow and other lachrymose specimens of horticultural art.

There have been constant allusions to this tree in English literature. Perhaps the most descriptive is one of Sir Walter Scott's which refers to the slender, pendulous boughs,—



EUROPEAN WHITE BIRCH
Betula alba

THE BIRCHES AND HORNBEAMS

“Where weeps the birch with silver bark
And long dishevelled hair.”

From an artistic point of view much has been said about these trees. In the “Sylvan Year,” Philip Gilbert Hamerton calls the stem of the birch “one of the masterpieces of Nature.” “Everything,” he says, “has been done to heighten its unrivalled brilliance. The horizontal peeling of the bark, making dark rings at irregular distances, the brown spots, the dark color of the small twigs, the rough texture near the ground, and the exquisite silky smoothness of the tight white bands above, offer exactly that variety of contrast which makes us feel a rare quality like that smooth whiteness as strongly as we are capable of feeling it. And amongst the common effects to be seen in all northern countries, one of the most brilliant is the opposition of birch trunks in sunshine against the deep blue or purple of a mountain distance in shadow.”

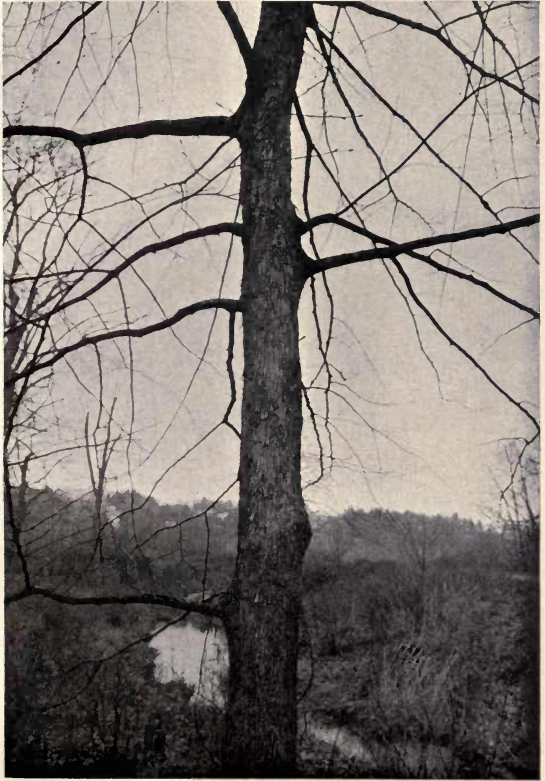
Miss Jekyll, in “Wood and Garden,” says that the tints of the stem give a precious lesson in color. “The white of the bark,” she says, “is here silvery white and there milk white, and sometimes shows the faintest tinge of rosy flush. Where the bark has not yet peeled off, the stem is clouded and banded with delicate

STUDIES OF TREES IN WINTER

gray and with the silver-green of lichen. For about two feet upward from the ground, in the case of young trees of about seven to nine inches in diameter, the bark is dark in color, and lies in thick and extremely rugged and upright ridges, contrasting strongly with the smooth white skin above. Where the two join, the smooth bark is parted in upright slashes, through which the dark rough bark seems to swell up, reminding one forcibly of some of the old fifteenth-century German costumes, where a dark velvet is arranged to rise in crumpled folds through slashings in white satin."

The wood is used in Europe for fuel and for making furniture. It is rather curious to find that the birch has been celebrated as an instrument of chastisement since early Roman times. Gerard says that in his time "schoolmasters and parents do terrify their children with rods made of birch"; and Shenstone, in the "Schoolmistress," has a pathetic little account of the fears of small boys as they watched the wind waving the branches of a birch tree growing by the schoolhouse,—

"For not a wind might curl the leaves that blew,
But their limbs shuddered, and their pulse beat low;
And, as they looked, they found their terror grew,
And shaped it into rods and tingled at the view."



HOP HORNBEAM
Ostrya virginiana

THE BIRCHES AND HORNBEAMS

The European birch is found throughout the North of Europe, and grows in every kind of soil, both wet and dry,—the Earl of Haddington called it, with quaint humor, “an amphibious plant,” and after two hundred years this is still descriptive of its habits.

It is perhaps unnecessary to say that the specific name, *alba*, alludes to the color of the bark.

**Hop Horn-
beam; Iron-
wood**
Ostrya virginiana

A small, slender tree, 30 to 50 feet high. The bark is light, and scales off in thin flakes, and is seldom more than a quarter of an inch thick. Small, acute buds; alternate leaf-scars; delicate twigs. Small catkins, usually three together, pointing upwards. Hop-like fruit, often remaining on the tree through the winter.

There is but one native hop hornbeam in New England, and it is an extremely interesting little tree. It grows under other trees in the forest, and is easily overlooked, usually being mistaken for a young elm. Of all trees the hop hornbeam is the most retiring in its habits, and takes much the same place among trees that the hare does among animals, or the violet among flowers, living a secluded life in wild places, where the woods partially conceal its identity.

Its outline against the sky in winter is most

STUDIES OF TREES IN WINTER

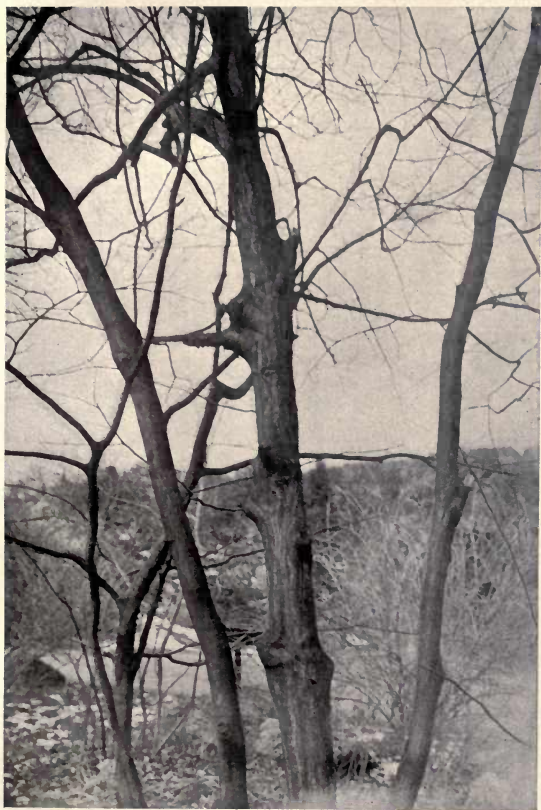
delicate and pretty, the twigs are very slender, and are tipped with the three little pointing fingers of the catkins, and the whole tree produces a most pleasing effect. Although the hop hornbeam frequents the woods, it never makes even a small area its own. It is always found mixed with other trees, and I have never seen even a little grove of hop hornbeam trees growing alone.

The wood is very strong, hard, heavy, tough, and durable, and is used for fence posts, the handles of tools, and small articles.

The generic name, *Ostrya*, comes from the Greek *ostryos* (a scale), in reference to the scaly catkins of the fruit. *Virginiana* is the specific name for the North American hop hornbeam as distinguished from the European species, which it closely resembles.

The hop hornbeam is found in rich woods from Nova Scotia to Northern Florida, and westward to Eastern Kansas.

Hornbeam; *A tree or tall shrub 10 to 25*
Blue Beech *feet high. Bark smooth and*
Carpinus caroliniana *dark gray, tough like a horn,*
and close-fitting. The buds are oval. Delicate
twigs, in flat, spreading layers. Alternate
leaf-scars. Fruit in clusters,—leaf-like bracts,
holding little nuts.



HORNBEAMS
Carpinus caroliniana

THE BIRCHES AND HORNBEAMS

The hornbeam, like the hop hornbeam, is a small tree and is found growing under larger trees in the woods. It is readily distinguished from the hop hornbeam by its smooth, dark bark, the hornlike appearance of which instantly suggests its name. There is but one native species in New England, and it is much smaller than its sister tree from Europe of the same name. The European hornbeam has long been used for making hedges, and in Germany the hornbeams are planted in such a manner that every two plants intersect each other in the form of a St. Andrew's cross. At the point where the two plants cross each other the bark is scraped off and the hornbeams are bound together closely with straw. The two plants grow together in a knot and send out horizontal shoots in a few years, making an impenetrable hedge. The hornbeam was much used in formal gardens for labyrinths, arcades, and groves, and as hedges for geometric designs known as "the star" and "the goose-foot."

The wood, like that of the hop hornbeam, is hard, heavy, strong, and close-grained. It is used for small articles like the handles of tools.

The generic name, *Carpinus*, comes from the Celtic *car* (wood), *pinda* (head), meaning that the wood was used for making the yokes of

STUDIES OF TREES IN WINTER

cattle. The specific name, *caroliniana*, was used to distinguish the American from the European species.

The hornbeam is found growing on the banks of streams and in moist woods throughout New England, and in the South and West.

CHAPTER VII

THE BEECH, CHESTNUT AND
OAKS



The Chestnut and the Beech.

Chapter VII

THE BEECH, CHESTNUT, AND OAKS

Family Fagaceæ

ALTHOUGH the beech, chestnut, and oaks are divided into three separate genera, they all belong to the family *Fagaceæ*. It is an interesting family in winter and deserves careful study, particularly the oaks, which have always been more or less confusing at first sight.

There is one native beech and one native chestnut, and there are eleven oaks in the Northeastern States.

American Beech

Fagus grandifolia

A beautiful, spreading tree 60 to 100 feet high, with a clean, close-fitting, smooth, gray bark. Buds narrow and sharp-pointed, with many overlapping scales. Twigs smooth, slender, and reddish brown, with alternate leaf-scars. Fruit, a prickly burr inclosing two triangular, sharp-ridged nuts, the burr hanging on the trees well into the winter.

STUDIES OF TREES IN WINTER

The beech is not so graceful as the elm, nor so lofty as the pine, nor so stalwart as the oak, but there is not a tree in the woods so distinctly lovable. In every detail the beech has a dainty, lady-like beauty, and among the leafless trees of the winter woods it is as fair as a flower, with its clean gray bole, its polished brown stems, and its slender, pointed, lance-like buds. There is no other tree with which the beech may be confused, and its characteristics are so pronounced and unvarying that there is little difficulty in recognizing it immediately in passing. When it has grown up partly shaded by other trees it has a lofty bearing, but when it has developed in open ground it is round-headed and spreading in shape. The beech trees from which the following photograph was taken were once shaded by other trees, and show this in the height they have attained and the absence of spreading, lateral branches.

The wood is hard, strong, and very close-grained and is used for making chairs, shoe lasts, the handles of tools, and for fuel. In old trees where the heartwood predominates the wood is red, and in younger trees where the sapwood is more conspicuous the wood is white, and these differences in color gave rise to the popular belief among woodcutters that



BEECH TREES
Fagus grandifolia



THE BEECH, CHESTNUT, AND OAKS

there are two species of beech. Michaux accepted this theory, which has since become obsolete. The nuts are sweet and edible, and are sold in Canada and some of the Western and Middle States.

The generic name, *Fagus*, comes from the Greek *phago* (to eat), in allusion to the nuts, which have always been used as food.

The beech is found from Nova Scotia to Florida and west to Texas.

European Beech <i>Fagus sylvatica</i>	<i>A large tree with spreading branches and a smooth, gray trunk. Buds narrow and sharp-pointed. Twigs slender, smooth, and reddish brown in color, with alternate leaf-scars.</i>
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Although the beech stands alone in having no other tree like it, yet it is extremely difficult to tell the American beech from the European species which is planted commonly in our parks and gardens. The bark of the European beech is a darker gray in color, its buds are grayer than those of the American, and the inner scales of the bud have a tendency towards being more hairy along their edges; for the rest we must trust to our intuition in telling the trees apart, unless we are in the woods and know that there the only indigenous beech is the American.

From the time of Virgil the praises of the

STUDIES OF TREES IN WINTER

beech have been sung in both poetry and prose. Passienus Crispus, the orator, who married the Empress Agrippina, was so fond of it that "he not only delighted to repose beneath its shade, but he frequently poured wine on its roots, and used often to embrace it." Evelyn and Cook recommended it, Boutcher thought that it "hardly had an equal," Mathews called it "the Hercules and Adonis" of the sylvia of Great Britain, and among the English poets Beaumont and Fletcher, Leigh Hunt, Gray, Campbell, and Wordsworth all loved and admired it for its rare beauty and vigor. Gilpin, however, does not join this chorus of praise; in his "Remarks on Forest Scenery" he calls it "an overgrown bush," and explains at some length his reasons for thinking that it lacks picturesque beauty.

In Europe the wood has been used for more purposes than in America, and it also ranks high as fuel. In France oil is made from beechnuts, used in lamps and for cooking. The specific name, *sylvatica*, is from the Latin which means belonging to the woods.

The purple beech is a variety of this tree, which has been propagated from the original sport found in a German forest over a hundred years ago. Plants from the seeds of the purple



TRUNK OF A YOUNG BEECH

THE BEECH, CHESTNUT, AND OAKS

beech have a tendency to revert to the original green, and to insure its peculiar colored foliage gardeners perpetuate it by layers. It is a highly artificial tree, and unless it is carefully placed in appropriate surroundings its effect is far from pleasing.

Chestnut *One of the largest of our forest*
Castanea dentata *trees. The bark is dark, hard,*
and rugged, with coarse ridges on old trees.
Light brown buds. Alternate leaf-scars. Re-
cent shoots are coarse and channelled with two
grooves running down from the base of each leaf-
scar, closely set with white or gray dots. Fruit
ripe in October.

At all times a giant among trees, the chestnut seems perhaps most remarkable in winter when the massive trunk and lofty branches can be fully appreciated. There is much beauty in the bark of this tree, the fissures sweep boldly up and down the trunk with broad, smooth spaces between the furrows and give a most pleasing impression.

It is interesting to find that the chestnut is one of the exceptions in nature to the rule that every tree has an unvarying mathematical arrangement of leaves on the stem. This regular distribution of leaves on the stem to economize space and light is called phyllotaxy,

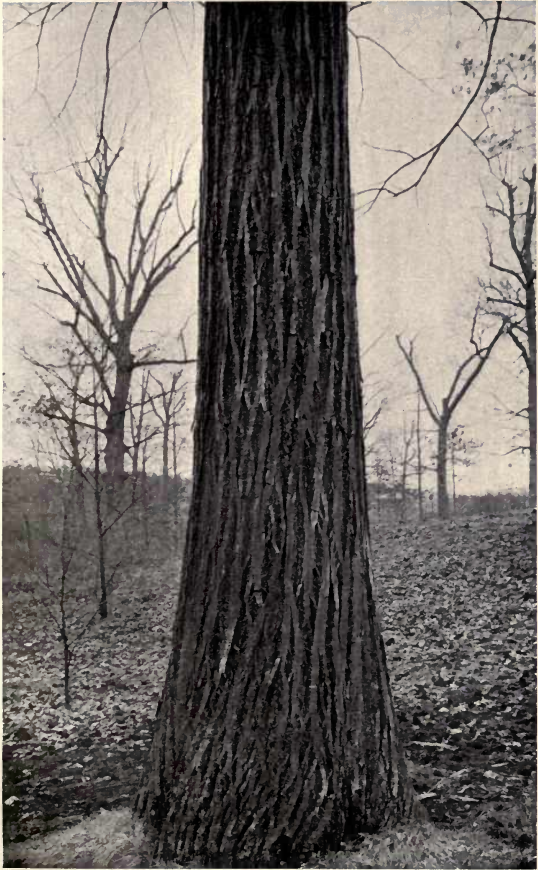
STUDIES OF TREES IN WINTER

and different trees follow various systematic arrangements. When the leaves or leaf-scars are alternate on the stem, as they are in those of the chestnut, the arrangement is spiral and one leaf follows another up the stem in ranks of two, three, five or more in definite order according to the kind of tree. In the chestnut, however, the phyllotaxy is frequently variable in different twigs of the same tree, and it follows an unruly, wayward leaf arrangement.

The wood of the chestnut is light, soft, and not strong, but it is used for making cheap furniture. It is also made into rails, posts, and railroad ties, as it is durable when used in contact with the soil. The nuts are sweet and edible and have great market value. The trees bear fruit when they are very young, and some Western farmers find that orchards of these trees bring better returns than the same amount of land in farm products.

The chestnut is closely allied to the sweet or Spanish chestnut of Europe. The nuts of the American species are sweeter than those of the Spanish chestnut, but they are much smaller. From a French experiment it was found that the kernel of the chestnut yields sixteen per cent of good sugar.

The generic name was taken from *Castanea*,





1. Red Oak. 2. Scarlet Oak. 3. Black Oak. 4. Pin Oak.
 5. Swamp White Oak. 6. White Oak. 7. Mossy-cup Oak.
 8. Post Oak. 9. Chestnut Oak.

THE BEECH, CHESTNUT, AND OAKS

a town in Thessaly, and the specific name, *dentata* (having teeth), refers to the serrations of the leaf. The chestnut is found throughout the Northeastern States.

Oaks *Quercus*

There are in all nearly three hundred different oaks which have been described by botanists, and fifty of these are found in North America, exclusive of Mexico. The oaks are large trees of temperate climates, and both in Europe and America few trees have the same varied and general usefulness. The extraordinary strength in the great, horizontal branches, their breadth and lateral sweep, and the rugged boldness of the trunk have long associated the oak with all that stands for strength, duration, and unswerving vitality. An oak never seems out of place; no matter whether we find it growing in unbroken forests, on a country estate, in a little garden, or by the roadside, it always harmonizes with its surroundings and adds to the composition of the landscape.

Oaks are divided into two groups, the white oaks and the black oaks. In New England there are eleven native oaks, six white oaks and five black. The white oak, the swamp white, the mossy cup, the chestnut, the dwarf chestnut, and the post oak belong to the first group, and

STUDIES OF TREES IN WINTER

the black oak, the red, the scarlet, the pin, and the bear or scrub oak belong to the second group.

The oak is distinguished from all other trees by its acorn.

The general characteristics of the oaks in winter are as follows:—

The upper lateral buds cluster at the top of the twig.

The buds have a tendency towards being five-sided in shape.

The bud scales are close and overlapping.

The leaf-scars project from the stem.

The bundle-scars are scattered over the leaf-scar.

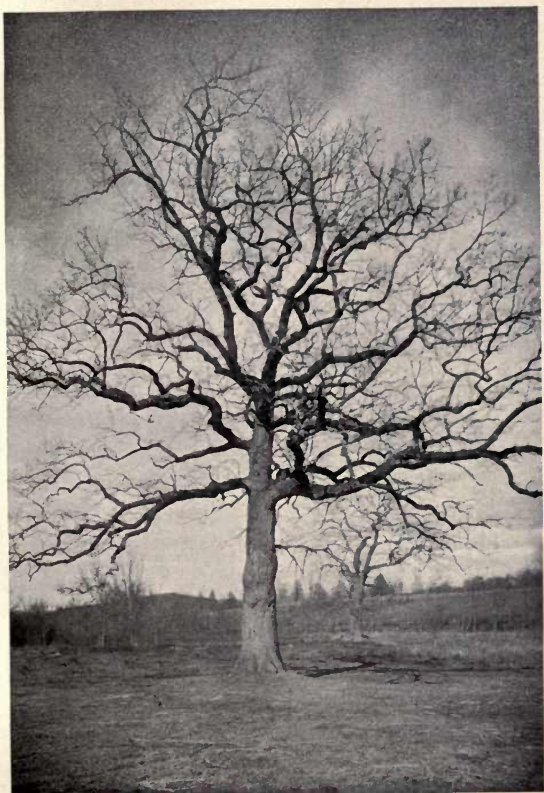
The pith is five-angled. By cutting a twig across, the pith can be seen in the centre in the form of a five-rayed star.

The leaves very often remain on oaks through the winter.

The following characteristics distinguish the white oaks from the black oaks:—

The bark of the white oaks is lighter in color than that of the black oaks, and it flakes off in strips instead of breaking away in coarse ridges, as it does in the black oaks.

The acorns of the white oaks mature in one year, those of the black oaks take two years to



WHITE OAK
Quercus alba

THE BEECH, CHESTNUT, AND OAKS

ripen, so that these young acorns are found on the branches of the black oak in winter.

The leaves of the white oaks have rounded lobes, and the lobes of the black oak leaves are tipped with a sharp bristle point.

The generic name, *Quercus*, comes from the Celtic *quer* (fine) and *cuez* (a tree), or possibly it may be derived from the Greek *choiros*, a pig, because in Europe pigs formerly fed on the acorns of oak trees.

White Oak *A large tree, 60 to 80 feet high,*
Quercus alba *with a trunk often six feet in diameter. The bark is light gray; the twigs smooth and light gray; the recent shoots light reddish or grayish brown; alternate leaf-scars. Small, round buds, smooth and short, about as long as they are wide. Acorns in a shallow, rough cup, often sweet and edible.*

The white oak seems to figure in one's earliest associations with the woods in winter. The sound of the withered leaves rustling in the wind is peculiarly suggestive of cold weather and dreariness, and invariably strikes the keynote of the woods on a bleak December day. Towards the end of winter the leaves are blown away or fall off, and then the beautiful ramifications and stalwart limbs of the trees are fully revealed. I have often noticed in the country

STUDIES OF TREES IN WINTER

that when one large, old white oak is found growing in an open pasture, there are usually five or six more of the same size and age within a short distance. This may be accounted for by the fact that in the early New England days these trees were in great demand for ship-building, and farmers waited for the most promising trees to reach maturity before selling them. On some farms these oaks happened to escape the axe, and have not only outlived the men who spared them, but stand for landmarks now, long after the farms themselves have been deserted and forgotten.

The wood of the white oak is very heavy and hard, and durable in contact with the soil. It is used in the construction and interior finish of buildings and in ship-building, for making carriages, cabinets, agricultural implements, baskets, and for fences and railroad ties. It also makes excellent firewood.

The specific name refers to the light color of the wood and bark in contrast with that of the black oaks. It is found from Southern Maine to Northern Florida and westward.

Swamp White Oak *A large tree, 60 to 80 feet high, common in swamps and where the soil is moist. The bark shags off along the branches, and the trunk is*
Quercus bicolor



TRUNK OF A WHITE OAK

THE BEECH, CHESTNUT, AND OAKS

more deeply fissured than that of the white oak. The twigs are coarser than those of the white oak, often shorter in length, and the stems are rounder. Short, thick-set buds and alternate leaf-scars. Acorns set in a shallow cup, often mossy-fringed at the margin; the nut is sweet and edible.

When once the swamp white oak's peculiarities are known it is seldom confused with any other oak, even in winter. Its unkempt appearance, the peeling away of the bark along the branches, and its generally straggling habit of growth distinguish it quite as much in the winter as at any other season of the year; it is at all times the untidy member of the oak family. The branches begin very low down on the trunk of this oak, and one can distinguish the tree from a distance in this way. Emerson says that in warm and sheltered situations it is a neat and beautiful tree, but that when it is too much exposed to the east or north wind it shows the effect by its ragged appearance; as one sees the tree generally through Southeastern New England one deduces from its appearance that the prevalent winds are those from the east and north.

The wood is heavy, hard, strong, and tough, and is used for the same things that that of the

STUDIES OF TREES IN WINTER

white oak is used for, and is not distinguished from it commercially.

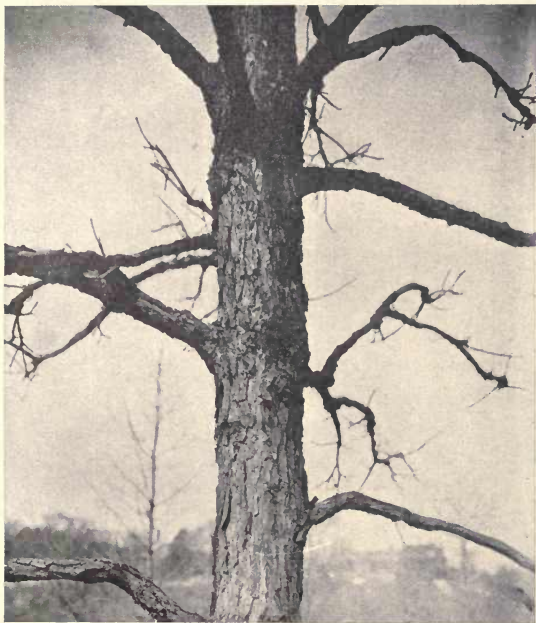
The former name, *platanoides* (platanus-like), came from the generic name of the plane tree or buttonwood, and refers to the bark of the young trees, which, like that of the buttonwood, separates and curls off in large thin flakes along the branches.

The swamp white oak grows in low, wet ground throughout the Northeastern States.

Mossy Cup, Overcup, or Bur Oak	<i>A large tree, sometimes 160 feet high. The bark is corky, with corky ridges along the twigs.</i>
<i>Quercus macrocarpa</i>	<i>The buds are like those of the swamp white oak, but the scales are more pointed. Often the dried stipule or a piece of it is left, as it is persistent in this species. Alternate leaf-scars. The acorn is almost entirely enclosed in a thick cup with a mossy fringed border.</i>

The curious corky ridges along the twigs distinguish the mossy cup oak at all seasons of the year, and its aspect in winter is unusual and picturesque, owing to this peculiarity.

The branches are irregular, the buds are small, and the acorns are large and enclosed for more than half their length in a cup covered with prominent scales and bordered with a thread-like fringe. Michaux says that these



MOSSY CUP OAK
Quercus macrocarpa

THE BEECH, CHESTNUT, AND OAKS

threads do not appear when the tree is in the midst of a forest or when the summers are not very warm.

The wood of the mossy cup oak is even more valuable than that of the white oak. It is heavy, strong, hard, tough, close-grained, and durable in contact with the soil. It is used for the same purposes as that of the white oak.

One can easily trace the family resemblance between the mossy cup oak and the cork tree of Southern Europe, which yields the cork of commerce.

The specific name, *macrocarpa*, comes from two Greek words meaning large fruit, and refers to the cups and acorns. The mossy cup oak is found in the West and in certain localities in New England. It is found on the banks of the Penobscot River in Maine, on the shores of Lake Champlain in Vermont, and among the Berkshire Hills, near Stockbridge, and on the banks of the Ware River in Massachusetts.

Chestnut or
Rock Chestnut
Oak

Quercus Prinus

A middle-sized or small tree usually, although it is sometimes 100 feet high. The bark does not flake. The buds are pointed, —an exception for the white oaks. The buds are long in proportion to their width. There is

STUDIES OF TREES IN WINTER

no pubescence on the bud, the edges of the scales are bleached and have turned gray, the centres remaining a rich reddish brown. Smooth, glossy twigs, more apt to be ridged than those of the white oak. Alternate leaf-scars. The acorn is covered nearly halfway with a thick cup. The kernel is sweetish and edible.

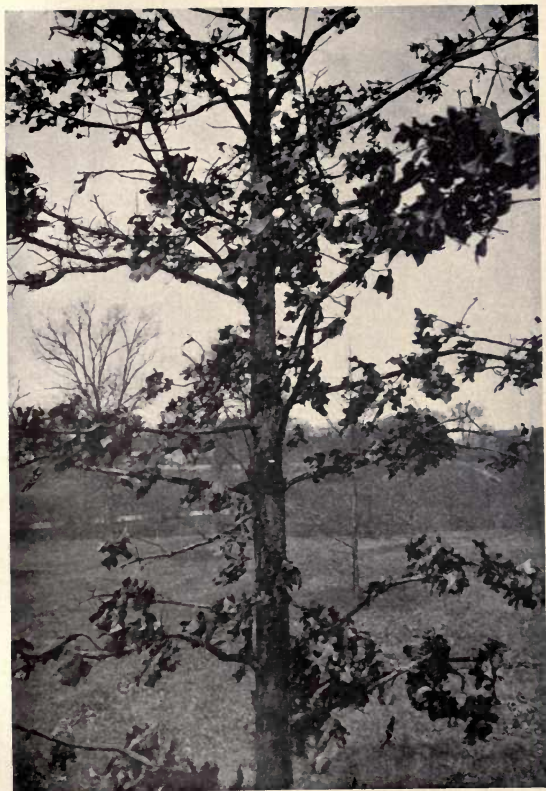
The chestnut oak is distinguished in winter by its beautiful smooth bark and by its pointed buds, entirely unlike those of the other white oaks. It sometimes grows to be a large tree, but in New England it is usually middle-sized or small.

The wood is heavy, hard, strong, and close-grained, and is used for making fences, railway ties, and for fuel. The bark is rich in tannin, and is used for tanning leather.

The specific name was derived from the Greek, and was the ancient name for an oak tree.

The chestnut oak is found on the banks of the Saco River and near Mount Agamenticus in Southern Maine, among the Blue Hills and in rich woods in Massachusetts, and it becomes more common as one goes south.

The dwarf chestnut, or chinquapin oak (*Quercus prinoides*), is the smallest member of the oak family in New England, and seldom



A YOUNG POST OAK

Quercus stellata

THE BEECH, CHESTNUT, AND OAKS

grows to be more than two or three feet high. It is found in Massachusetts and in the South and West.

It is a small shrub of no commercial value, although its little branches are rich in tannin. The specific name, *prinoides*, means prinus-like, the name of the chestnut oak, and refers to the general resemblance between the two species.

Post or Rough
Oak

Quercus stellata

A medium-sized tree, 40 to 50 feet high. Buds and twigs stumpy and thick set with short branching. Buds very round and rusty. Twig persistently rough, alternate leaf-scars, the bark is hard and rough. Acorn enclosed in a deep, saucer-shaped cup.

The branches of the post oak are so thick set, short, and crooked that this oak is seldom confused with any other. It rarely grows to be more than twenty-five or thirty feet high, and the many low, crooked branches, crowded together at the base of the trunk, give, as Emerson says, the effect of the top of a tree whose trunk is under ground. The leaves of the post oak are often held through the winter, and they are so stiff, rough, and abundant that they are, in themselves, a distinguishing mark. The specimens in the Arnold Arboretum, from which the

STUDIES OF TREES IN WINTER

accompanying photograph was taken, holds its leaves later in the spring than any of the other oaks.

The wood is heavy, close-grained, hard, and durable, but it is difficult to season. It is used in the construction of houses, in the manufacture of carriages, and for cooperage, fencing, railway ties, and for fuel.

The former name, *minor* (smaller), referred to the height of this oak as compared with that of the larger members of the family.

The post oak is found from Southern Massachusetts—on Cape Cod, on the islands of Martha's Vineyard and Naushon—to Northern Florida and, in certain localities, west to Eastern Kansas.

Black Oak *A large tree, 70 to 80 and (rarely)*
Quercus velutina *150 feet high. Bark thick, rough,*
and dark. Twigs smooth, with a bitter taste.
Alternate leaf-scars. Buds very downy, sharp-
pointed, and large. The acorns are set in a
deep, conspicuously scaly cup. The kernel is
bitter.

The black oak is distinguished by its rough, dark outer bark and rich yellow inner bark (which is seen when a small cut is made with a penknife), and its downy pointed buds. On young trees as well as old ones, the bark is very



BLACK OAK
Quercus velutina

THE BEECH, CHESTNUT, AND OAKS

rough at the base of the trunk, and this roughness extends upwards in old trees.

The round, thin, brittle balls found on black oaks and known as oak-apples are produced by an insect which injures the leaf by puncturing it and depositing an egg. This causes irritation and an abnormal growth, from which the apple is formed. The grub which lives inside this excrescence becomes a chrysalis in the autumn, and changes to a fly in the spring, when it gnaws its way out by making a little hole through the shell.

The wood of the black oak is heavy, hard, and strong, but not tough, and it is liable to check in drying. The bark is rich in tannin, and it makes a yellow dye,—quercitron,—obtained from the inner bark. Used medicinally the bark is an astringent.

The specific name, *velutina*, was taken originally from the Latin word *vellus*, meaning shorn wool, and was applied by botanists to this tree on account of the fleecy character of the recent stems and leaves. The black oak is found growing throughout New England and in the South and West.

Red Oak	<i>A large tree, 60 to 150 feet high.</i>
<i>Quercus rubra</i>	<i>The bark is fissured in long clefts, with broad, smooth places between, giving the</i>

STUDIES OF TREES IN WINTER

trunk a fluted column effect. Large, sharp-pointed buds, with close scales. The red oak buds resemble to some extent those of the chestnut oak, but there is a fine hair on the scales of the red oak buds, while the scales of the chestnut oak buds are bleached and have no hair. Where the base of the bud joins the stem the buds of the red oak are more constricted than those of the chestnut oak, and the chestnut oak buds seem more sessile. Alternate leaf-scars. Acorn set in a shallow cup of fine scales.

The red oak is a lofty, wide-spreading tree of great beauty. "No other oak," Emerson says, "flourishes so readily in every situation, no other is of so rapid growth, no other surpasses it in beauty of foliage and of trunk; no oak attains, in this climate, to more magnificent dimensions; no tree, except the white oak, gives us so noble an idea of strength."

It is perhaps of all the black oak group, the easiest to distinguish in winter on account of the smooth spaces between the fissures of the bark on its trunk, and its pointed buds, which are much less downy than those of the black oak.

The wood is heavy, hard, and strong, but it is not particularly valuable. It is used in the construction and interior finish of houses and for making cheap furniture.



RED OAK
Quercus rubra

THE BEECH, CHESTNUT, AND OAKS

The specific name, *rubra*, was given to it on account of the rich, red midrib and veins of the leaves.

It is the oak which is found farthest north, and it grows in all kinds of soil from Nova Scotia southward to Northern Georgia. The red oak was one of the earliest American trees introduced into Europe.

Scarlet Oak *A large tree, 60 to 80 feet high.*
Quercus coccinea *The bark is grayish and not deeply furrowed. Slender twigs, with small alternate leaf-scars. Small buds, the tips being half as hairy as those of the black oak, while the bases are smooth. The acorn is one-half or more enclosed in a coarsely scaled cup. Its kernel is bitter.*

The scarlet oak is the most brilliant member of the oak family. In summer its leaves are a shining green, in autumn they turn more glowingly red than those of any other oak, and in winter its buds and stems are smooth, and show more color than those of the other members of the genus. Its outline is less spreading in shape than those of oaks generally, and the bark of the trunk is not so coarsely furrowed as the black oak's, nor so smooth as that of the red oak.

The wood is heavy and hard, and is used for the same purposes as red oak.

STUDIES OF TREES IN WINTER

The specific name, *coccinea* (of a scarlet color), refers to the hue of the foliage in the autumn.

The scarlet oak is found growing throughout the Northeastern States and also in the South and West.

Pin Oak *A small or medium-sized tree in*
Quercus palustris *New England, although it reaches*
the height of 120 feet in the forests of the West.
It is excurrent in growth. In its youth the
branches are rigid and horizontal, and have a
tendency to droop stiffly towards the ground.
The branches and twigs are persistent, some of
the twigs often becoming small, stiff, pin-like
spurs, which are a distinctive characteristic of
the tree. The buds are small and the twigs slender.
Alternate leaf-scars. The acorn is half
an inch long, in a shallow, saucer-shaped cup
with thin scales.

The outline of the pin oak is not in the least like that of any other oak after its leaves have fallen; for while most oaks are distinguished by their far-reaching lateral branches which divide a short distance at the trunk, the pin oak carries its main stem to the top of the tree, and the lateral branches grow from the trunk, forming a pyramidal head. In the forests where it grows in swamps and wet places, it loses this



• TRUNK OF A RED OAK

THE BEECH, CHESTNUT, AND OAKS

shape, but even then the branches are characteristically rigid and grow near together. The pyramidal shape of this tree, its small, delicate buds and branches, and the pin-like twigs, from which it takes its name of pin oak, make it easily recognized as we see it growing in our parks and gardens.

The wood is hard and strong, where the tree is found growing commonly, and is used in the construction of houses and for shingles and clapboards.

The specific name is from the Latin *paluster*, an adjective meaning swampy or boggy, and has reference to the moisture-seeking characteristics of the tree.

The pin oak is found growing on the banks of the Connecticut River in Massachusetts, but it occurs more commonly in the South and West.

The scrub or bear oak (*Quercus ilicifolia*) is a dwarfed, straggling bush, three to ten feet high, and found on sandy, barren, and rocky hills from Maine to Carolina. The former name, *pumila* (dwarf), was given to it on account of its size and crooked manner of growth.

THE BEECH, CHRISTNUT, AND OAK

They had even the same characters - the beeches are characteristically rigid and grow near together. The growth habit of this tree is small, dense, and bushy, and the foliage is very dark. It is taken to be of the oak, and it is very common as we see it growing in our parks and gardens.

The wood is hard and strong, and is used in the construction of houses and for other purposes.

There is also a tree called the chestnut, which is very common in our parks and gardens. It is taken to be of the oak, and it is very common as we see it growing in our parks and gardens.

The oak is a tree of the forest, and is very common in our parks and gardens. It is taken to be of the oak, and it is very common as we see it growing in our parks and gardens.

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PIN OAK

Quercus palustris



CHAPTER VIII

THE ELMS AND THE HACKBERRY





The Slippery Elm and the American Elm.

Chapter VIII

THE ELMS AND THE HACKBERRY

Family Ulmaceæ

THE members of this family are found in Europe, Asia, and North America. Two genera, the elm (*Ulmus*) and the hackberry (*Celtis*), are found in the Northeastern States.

The elms are remarkable for the massive strength of their trunk and limbs and for the light delicacy of their small branches and twigs as we see them against the sky in winter. The American and English elms particularly are really more beautiful in winter than in summer, when the contrast between the little twigs and the little branches is hidden by the leaves. The elms are all long-lived trees and grow rapidly. They bear transplanting and pruning better than any other tree, and grow on almost any kind of soil. If it were not for the attacks of insects, to which the elms seem peculiarly liable, no trees would be more deserving of cultivation. Perhaps no other tree is so strongly

STUDIES OF TREES IN WINTER

associated in our minds with the beautiful old valley towns and hillside villages of New England, and to the elms they largely owe their beauty. Three indigenous elms are found in the Northeastern States, the American, slippery, and cork elms, and two from Europe, the English and the Scotch or Dutch elms, are planted commonly in our gardens and parks.

American or White Elm *Ulmus americana* *A large, spreading tree, with graceful, drooping branches. Smooth brown twigs; alternate leaf-scars.*

The terminal and lateral buds are the same size; the flower buds are larger. The flowers come before the leaves in the early spring, and the fruit, a small round samara, ripens later in the spring.

The American elm stands absolutely alone among trees for its especial kind of beauty. No other tree combines such strength and lofty stateliness with so much fine work and delicacy. Its trunk divides a short distance from the ground into many large, spreading branches, which stretch up high into the air and support the waving, drooping, curving twigs and small branches.

It is interesting to find how many distinct shapes the American elm takes. These are so varied that many people think that each form



AMERICAN ELM, LANCASTER, MASS.

Ulmus americana

(From a photograph by Mr. Eli Forbes)

THE ELMS AND THE HACKBERRY

is a separate species, but they are all different types of the same tree. The Etruscan vase is one of the most familiar shapes of this elm. Its trunk divides a short way from the ground into several equally large branches, and the top of the tree is flat, with down-sweeping lateral branches. The beautiful Lancaster elm, from which the accompanying photograph was taken, belongs to this Etruscan vase form. Another well-known shape is the plume, which may be either single or compound. In these trees the single trunk or two or three parallel limbs rise to a great height without branches, and these spread into one or two light waving plumes. Many of these plume elms are found in the Berkshire Hills and throughout New England where the woods have been cut away and the elms have been left standing. The oak form, still another shape the elm occasionally takes, is broad and round-headed, with heavy lateral branches which extend in a horizontal direction in a manner very suggestive of the white oak. This is not so common as the vase and plume elms, and only occurs when the tree has grown in an open situation with plenty of air and light. A fine specimen of this tree stands near the Pratt house, in Concord, Massachusetts. "Feathered" elms are those which have a

STUDIES OF TREES IN WINTER

growth of little twigs along the trunk and branches. They may feather any of the different forms already described, and they come from latent buds which may have been dormant for years before opening.

“The white elm,” Professor Charles S. Sargent says, “is one of the largest and most graceful trees of the Northeastern States and Canada. It is beautiful at all seasons of the year, — when its minute flowers, harbingers of earliest spring, cover the branches; when in summer it rises like a great fountain of dark and brilliant green above its humbler companions of the forest or sweeps with long and graceful boughs the placid waters of some stream flowing through verdant meadows; when autumn delicately tints its leaves; and when winter brings out every detail of the great arching limbs and slender pendulous branches standing out in clear relief against the sky.

“The elm trees which greeted the English colonists as they landed on the shores of New England seemed like old friends from their general resemblance to the elm trees that had stood by their cottages at home; and as the forest gave way to cornfields many elm trees were allowed to escape the axe, and when a

THE ELMS AND THE HACKBERRY

home was made a sapling elm taken from the borders of a neighboring swamp was often set to guard the rooftree. These elm trees, remnants of the forest which covered New England when it was first inhabited by white men, or planted during the first century of their occupation, are now dead or rapidly disappearing; they long remained the noblest and most imposing trees of the Northern States, and no others planted by man in North America have equalled the largest of them in beauty and size."

The wood is heavy, tough, and difficult to split. It is used for making the hubs of wheels and for flooring, cooperage, and boat-building.

The generic name, *Ulmus*, comes from ulm or elm, the Saxon name of the tree, the specific name explains itself. The American elm is found from Newfoundland to Florida and as far west as the eastern base of the Rocky Mountains.

Slippery or
Red Elm
Ulmus fulva

A medium-sized tree, 45 to 60 feet high. The twigs are gray and bristled, unlike the smooth twigs of the white elm. Alternate leaf-scars, which are more conspicuous than those of the white elm. The buds are larger and rounder than those of the white elm; they are soft and

STUDIES OF TREES IN WINTER

downy, and are covered with reddish brown hairs. The inner bark is very mucilaginous.

Country boys know the slippery elm for its sweet mucilage, just as they know the shag-bark for its nuts, the sassafras for its aromatic roots, and the spruce for its gum; and this mucilaginous characteristic is a certain means of determining the tree.

In form it is less drooping than the white elm and it is also much smaller. The hairy buds give the whole tree a reddish color in spring, and from this it probably takes the name of red elm; the slippery elm is a more characteristic name however, as few trees have such a slippery inner bark. These hairy brown buds are among the prettiest to be found on any trees in winter. Compared with the smooth, hard buds on many trees, they are what soft, long-haired Angoras are to ordinary cats.

The wood is strong, hard, and close-grained and is used for making posts, railroad ties, and agricultural implements. The inner bark is used for inflammatory diseases and externally for poultices.

Its former name, *pubescens* (down or soft hair), referred to the pubescence on the buds and leaves and along the recent shoots.

The slippery elm is found in certain local-



YOUNG CORK ELM

Ulmus racemosa

THE ELMS AND THE HACKBERRY

ities throughout the Atlantic States, it is not common in Eastern Massachusetts.

Cork or Rock Elm *Ulmus racemosa* *A large tree, 80 to 100 feet high, known by the peculiar corky ridges along the branches. Alternate leaf-scars. The recent twigs and the scales of the bud are fringed with downy hair.*

In New England the cork elm is found in the northwestern part of New Hampshire and in Southern Vermont. It is rare in Massachusetts, and would probably be found only in the western part of the State growing wild. Neither Michaux nor Emerson has described the cork elm. Nuttall says that it was discovered in the State of New York by a Mr. Thomas, and he gives the tree the name "Thomas's elm," which has fortunately not been retained.

The wood is tougher and of somewhat finer grain than that of the white elm, and in the "Silva of North America," Professor Sargent says: "The value of the wood of the rock elm threatens its extinction; and most of the large trees have already been cut in the forests of Canada, New England, New York, and Michigan. The rock elm is sometimes planted as a shade tree in the region which it inhabits naturally, and although it grows rather more slowly than the white elm, it is a handsome and distinct

STUDIES OF TREES IN WINTER

ornamental tree which planters have too generally neglected."

The specific name, *racemosa* (cluster-flowered), refers to the flowers which grow in a raceme.

It is found in New England, its range extending southward and westward.

English Elm *A tall tree, more upright in growth than the American elm. The branches are less spreading and more erect than those of the American species. In this climate it is often distinguished by the little tufts of dead twigs on the tree. The bark is darker and coarser than that of the American elm; the buds and twigs differ very little from those of our species.*

The English elm is found planted frequently throughout New England, and there are many fine specimens in Massachusetts, especially in the country about Boston. According to Emerson, they were originally said to be imported and planted by a wheelwright for his own use in making the hubs of wheels, for which purpose the wood of the English elm is superior to any other. At all events, there are many beautiful specimens growing near old colonial houses, and sometimes they are found growing by stone walls at some distance from the house, back of farm buildings and barns, as was



ENGLISH ELMS
Ulmus campestris

THE ELMS AND THE HACKBERRY

the group from which I took the following photograph.

The American elm is more graceful than the English elm, which, on the other hand, is more stately; both trees are unusually beautiful, although representing such different types of beauty. In the "Autocrat of the Breakfast-Table," Dr. Holmes contrasts the English and American elms growing on Boston Common. "Go out with me into that walk which we call the Mall," he says, "and look at the English and American elms. The American elm is tall, graceful, slender-sprayed, and drooping as if from languor. The English elm is compact, robust, holds its branches up, and carries its leaves for weeks longer than our own native tree. Is this typical of the creative force on the two sides of the ocean or not?"

In England the elm has been planted from the time of the Romans, though Dr. Walker thinks that it was brought over at the time of the Crusades. The elm was planted by the Romans as a prop for grape vines, and in the South of Italy it is still used for that purpose. In "Paradise Lost" Milton refers to this when he describes how Adam and Eve spent their time in the Garden of Eden. Among various other occupations,

STUDIES OF TREES IN WINTER

“ They led the vine
To wed her elm ; she spoused about him twines
Her marriageable arms ; and with her brings
Her dower, the adopted clusters to adorn
His barren leaves.”

Columella tells us that vineyards with elm trees as props were named *arbusta*, the vines themselves being called *arbustivæ vitæ*, to distinguish them from others raised in more confined situations. Once in two years the elms were carefully pruned to prevent their leaves from overshadowing the grapes ; this was considered of great importance, and we have a better understanding of Virgil's reproach to Corydon, who neglected both his elms and vines, when we realize this : —

“ Semiputate tibi frondosa vitis in ulmo est.”
(Your vine half pruned upon the leafy elm.)

In Ovid, Vertumnus alludes to the mutual dependence of the elm and the vine when he assures Pomona of the advantages of a happy marriage : —

“ ‘ If that fair elm,’ he cried, ‘ alone should stand
No grapes would glow with gold, and tempt the hand ;
Or if that vine without her elm should grow,
'T would creep a poor neglected shrub, below.’ ”

The specific name, *campestris*, comes from the Latin word meaning belonging to a plain or field.



SCOTCH ELM

Ulmus glabra

THE ELMS AND THE HACKBERRY

Scotch, Dutch, or Wych Elm *Ulmus glabra* *A medium-sized tree, 50 to 60 feet high. The bark is smooth and green. The branches are spreading and somewhat drooping. The buds are not downy like those of the slippery elm.*

The Scotch elm, like the English elm, is extensively cultivated in the parks and gardens about Boston, and it is frequently planted along roadsides. It is less upright and tall than the English elm, its average height being about forty feet, and it has a more spreading head.

The Scotch elm, according to Gerard, had various uses in ancient times. Its wood was made into bows, and its bark, which is so tough that it will strip or peel off from the wood from one end of a bough to the other without breaking, was made into ropes. Its wood was not considered so good for naves as that of the English elm, though in Scotland it is used by ship-builders, the block and pump maker, the cartwright and cabinet maker. Loudon says in his "Arboretum et Fruticetum Britannicum": "In many parts of the country, the wych elm, or witch-hazel, as it is still occasionally called, is considered a preservative against witches; probably from the coincidence, between the words 'wych' and 'witch.' In some of the midland counties, even to the pres-

STUDIES OF TREES IN WINTER

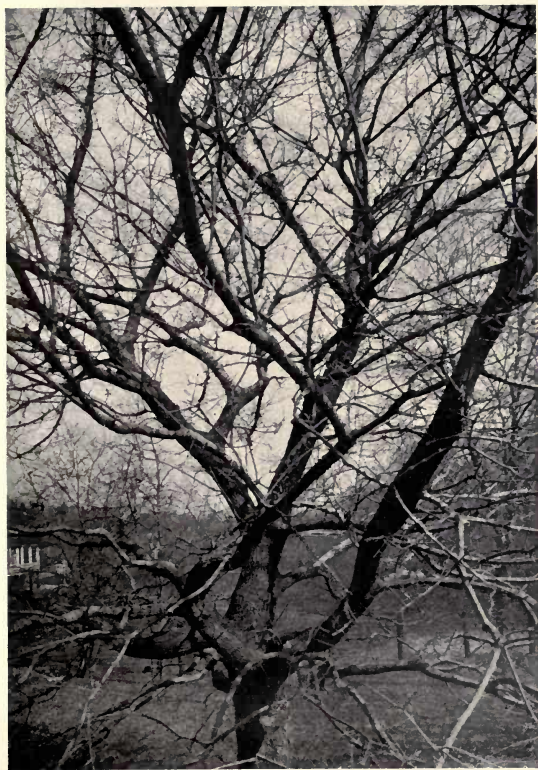
ent day, a little cavity is made in the churn to receive a small portion of witch-hazel, without which the dairymaids imagine that they would not be able to get the butter to come."

The former name, *montana*, from the Latin word meaning living on mountains, was given to this tree because it is found growing, not only in the plains and valleys, like *Ulmus campestris*, but also in the remote highlands where it finds a foothold and flourishes on the steep slopes of the mountains.

Hackberry,
Sugarberry,
Nettle Tree
Celtis occidentalis

A small tree, 20 to 50 feet high, with slender, wide-spreading branches. The terminal buds are lacking, the lateral ones are flattened and pointed and somewhat hairy. The twigs are dark grayish brown with white chambered pith inside the stems. The leaf-scars are semi-oval with three bundle-scars and alternate in arrangement. The fruit is reddish, turning dark purple; it is round and berry-like and about the size of a currant.

The hackberry grows wild in Massachusetts, but it is found rarely and is generally mistaken for an elm. It grows commonly in lowland woods in Western New York and the Middle States, and it can be identified both in winter and summer by the white chambered pith,



HACKBERRY
Celtis occidentalis

THE ELMS AND THE HACKBERRY

which is found by cutting a stem of recent growth. The dried fruit, which hangs on the stems through the winter, is also another means of recognizing the tree,—this berry-like fruit can be seen in the photograph which I took as late in the deciduous season as April thirteenth. It is a round-headed tree with a short trunk and usually a broad spread of branches, but in the basin of the Ohio River it grows to be a tall and stately tree.

The wood is heavy and coarsely grained, and is used for fences and for making cheap furniture.

The generic name, *Celtis*, is the ancient Greek name for the lotus berry; and the specific name, *occidentalis* (belonging to the west), designates its American origin.

CHAPTER IX

THE BUTTONWOOD, THE TUPELO,
AND THE MULBERRIES



The Buttonwood, showing the hollow base of the leaf-stalk which covers the bud until the leaf falls.

Chapter IX

THE BUTTONWOOD, THE TUPELO, AND THE MULBERRIES

Families Platanaceæ, Cornaceæ, and Moracæ

THERE is but one genus in the family *Platanaceæ*, and but one species in the genus found growing in the North-eastern States, the buttonwood, or sycamore.

Buttonwood,
Sycamore, or
Plane Tree
Platanus occidentalis

A large tree, 80 to 100 feet high, with an irregular, picturesque outline. The bark breaks off in thin, brittle plates at the base of the trunk, and higher up it is smooth, an olive green color, and covered with white blotches. The buds are subpetiolar, — that is, they are covered over by the base of the leafstalk through the summer, and concealed entirely until the leaf drops off. The leaf-scar is in the shape of a ring around the bud, with prominent bundle-scars; the arrangement of the leaf-scars is alternate. Stipule scars are found on the stems in some places. The buds are conical, smooth,

STUDIES OF TREES IN WINTER

and brown, and are covered by one scale. The fruit hangs on the tree all winter, — a large, dry ball made up of hundreds of seeds.

Like everything which has a definite individuality, the buttonwood is a tree which people either like or dislike strongly. It is certainly picturesque, and its subpetiolar buds alone make it unusually interesting, whether one admires it or not from an æsthetic point of view. These buds are entirely concealed through the summer by the hollow bases of the leafstalks which fit over the buds like candle extinguishers, and leave scars in circles after they have fallen.

Its bark has little expansive power, the tissue is rigid and cannot stretch with the growing power from within, and it splits and is thrown off easily. In connection with this, Dr. Holmes says in "The Autocrat of the Breakfast-Table": —

"The buttonwood throws off its bark in large flakes, which one may find lying at its foot, pushed out, and at last pushed off, by that tranquil movement from beneath, which is too slow to be seen, but too powerful to be arrested. One finds them always, but one rarely sees them fall. So it is our youth drops from us — scales off, sapless and lifeless, and



BUTTONWOOD
Platanus occidentalis



TRUNK OF A BUTTONWOOD

BUTTONWOOD AND MULBERRIES

lays bare the tender and immature fresh growth of old age."

Bryant says in his poem, "To the Green River": —

"Clear are its depths where its eddies play,
And dimples deepen and whirl away,
And the plane tree's speckled arms o'ershoot
The swifter current that mines its root."

Gray calls the buttonwood our largest tree, and Emerson alludes to it as "the largest, grandest, and loftiest deciduous tree in America;" while Gilpin says that "no tree forms a more pleasing shade than the occidental plane."

The wood takes a good polish and is used for making furniture, ox yokes, and for the interior finish of houses.

The generic name, *Platanus*, comes from the Greek word for broad, and has reference to the wide-spreading leaves and branches of the tree. The specific name, *occidentalis*, was given to the sycamore as distinctive from *Platanus orientalis*, the oriental plane tree of Europe. The oriental plane is planted occasionally in this country, and may be distinguished from our native species by its broader head and by the fruit, which frequently hangs in clusters instead of singly on the tree.

STUDIES OF TREES IN WINTER

The *Cornaceæ* or dogwood family contains two New England genera. Among many species of shrubs, two trees deserve especial notice, the tupelo and the flowering dogwood.

Tupelo, Pepperidge, Sour Gum Tree
Nyssa sylvatica

A medium-sized tree, with horizontal branches and often with an excurrent trunk. Dark gray furrowed bark. Grayish brown twigs, with alternate ridged leaf-scars and three bundle-scars at the top of the leaf-scar. Small, brown buds, with overlapping, hairy scales. The fruit is a small, bluish black drupe, ripe in the autumn.

The tupelo at all seasons is a striking tree, and is easily distinguished even at a distance by its flat, rigid branches, growing in horizontal layers from the main trunk. It varies much in shape, according to its surroundings in youth. When it has grown up among other trees in the woods it is erect and tall, and when it has stood by itself in open ground it is low and broad, and almost always carries its main trunk well into the top of the tree.

The wood is heavy, tough, and hard to work, and the fibres intertwine so closely that it is very difficult to split. It is used in making the hubs of wheels and ox yokes.

The generic name, *Nyssa*, is the Greek name



TUPELO
Nyssa sylvatica

BUTTONWOOD AND MULBERRIES

of a nymph, and was given to the tupelo on account of its habit of growing in wet places, on the borders of ponds, and in low, moist woods. The specific name is frequently given to plants and trees, and comes from the Latin word which means belonging to the woods.

It is found from Maine to Florida and westward, and stands the winds from the sea well when it grows along the coast, apparently losing little of its vigor.

Flowering Cornel, Flowering Dogwood
Cornus florida

A small tree or shrub, 12 to 40 feet high, with a dark, rough bark. The recent shoots are gray and covered with down. The leaf-scars are small and opposite each other on the stem. The flower buds are conspicuous.

The flowering cornel can be distinguished by its flower buds alone in winter, if by nothing else. They are small and round with long curving tips, and in shape they look something like the paper torpedoes children play with on the Fourth of July. This is the only native tree in our climate, besides the maple and ash, which has opposite leaf-scars.

The confusion existing in some minds between the flowering dogwood of the woods and the poison dogwood of the swamps casts an undeserved shadow over the name of the former.

STUDIES OF TREES IN WINTER

If the poison dogwood were always called poison sumac and the *Cornus florida*, flowering cornel, this unfortunate confusion would soon end.

The wood is strong, hard, and close-grained, and takes polish exceedingly well. It is used in turnery, for the handles of tools, and occasionally for engravers' blocks. The bark is bitter and is used as an astringent and tonic, especially in the treatment of fevers. The Indians made a scarlet dye from the bark of the roots.

The generic name comes from the Latin *cornus*, a horn, and refers to the hardness of the wood, and the specific name, *florida* (abounding in blossoms), alludes to the remarkable white flowers of this cornel, which open in June.

The flowering dogwood is found from Eastern Massachusetts to Central Florida and westward, and grows under large trees in rich woods.

The *Moracæ* are a small family with but one native representative in the North, the red mulberry. The white mulberry from China has been so widely cultivated and naturalized in the United States, that it is seen more commonly than the native species.



RED MULBERRY

Morus rubra

BUTTONWOOD AND MULBERRIES

Red Mulberry *A small tree, 15 to 60 feet high.*

Morus rubra *The bark is rough, with long furrows. The twigs are a light greenish brown and the leaf-scars are oval, hollow, and alternate in arrangement. The bundle-scars form a closed chain around the leaf-scar. A milky juice comes if the stems are cut on warm days in winter. Very smooth buds.*

The red mulberry is not particularly attractive in winter. In open situations its branches are wide spreading without being graceful, and it is broadly erect in shape without being stately. It grows to be a much larger tree in the South than it does in the North.

The wood is soft and light, but very durable, and it is used for fences and cooperage, and in the South for boat-building. The fruit is edible, with an agreeable acid flavor.

The generic name, *Morus*, is probably derived from the Celtic word *mor*, meaning black, in reference to the color of the fruit. The specific name, *rubra*, is given to this species because the mulberries are dark red instead of white, like those of *Morus alba*.

The red mulberry is found growing wild in Western Massachusetts, south to Florida and westward. It is frequently planted in gardens for its fruit.

STUDIES OF TREES IN WINTER

White Mulberry
Morus alba

A small tree, with a rough bark, small, round brown buds, and small projecting alternate leaf-scars with clearly defined bundle-scars. The buds are smaller and more rounded than those of the red mulberry. It is easily distinguished from the red mulberry by its more numerous and slender shoots.

Professor Charles S. Sargent says that no other tree furnishes employment, directly and indirectly, to so large a number of the human race, or has been so carefully studied from the cultural point of view, and no other tree has given rise to such a voluminous literature as the white mulberry.

It was introduced here from China about 1830, and it has been widely cultivated and naturalized throughout the United States. The Chinese were the first to cultivate the mulberry for feeding silkworms, and they are said to have discovered the art of making silk 2700 years B. C. According to Loudon the discovery is due to the keen powers of observation of the Empress Si-ling-chi, who watched the labors of silkworms on wild mulberry trees, and who first applied their silk to use. It is interesting to associate the making of silk with an empress who loved nature and used her eyes two thou-



WHITE MULBERRY
Morus alba

BUTTONWOOD AND MULBERRIES

sand years and more B. C. From China the art passed into Persia, India, Arabia, and finally (350 B. C.) into Greece. In 1440 A. D. the white mulberry was introduced into upper Italy, and during the reign of Charles VII. the first white mulberry was planted in France. In 1609 the silkworm was introduced into Great Britain by James I., and at the same time he sent over mulberry trees and silkworms to America, and tried to induce the colonists in Virginia to cultivate silkworms instead of raising tobacco.

The wood has been used for making wine casks in Europe, and is highly valued on account of the supposed violet flavor it gives to white wines. The bark is used for making bast for mats, and linen also has been made out of it. The fruit of the white mulberry is insipid and tasteless.

CHAPTER X

THE LOCUSTS, THE YELLOWWOOD,
AND THE KENTUCKY
COFFEE TREE



The Common Locust and the Honey Locust.

Chapter X

THE LOCUSTS, THE YELLOWWOOD, AND THE KENTUCKY COFFEE TREE

Family Leguminosæ

THE *Leguminosæ* are a large order of plants including many different genera, — from the little clover by the wayside to the honey locust trees, 140 feet high. The trees of the different genera are all distinguished by their pod-like fruit, — the name *Leguminosæ* being given to this family on account of the leguminous or bean-like pods which enclose the seeds.

They are interesting to study on account of the buds, which differ in structure from the hidden buds of the locusts enclosed in the stem, to the subpetiolar buds of the yellowwood, concealed under the leafstalks through the summer, but conspicuous in winter after they have fallen.

Common	<i>An irregular growing, slender</i>
Locust	<i>tree, 70 to 80 feet high, with</i>
<i>Robinia Pseudo-Acacia</i>	<i>very rough, deeply furrowed,</i>

STUDIES OF TREES IN WINTER

often yellowish-looking bark. Slender twigs, with inconspicuous thorns. Small, alternate triangular leaf-scars, somewhat raised in the centre. The buds are superposed between the thorns, and are entirely hidden by the leaf-scars. Fruit a pea-shaped pod, four or five inches long.

The common locust is one of the few trees which is decidedly more attractive in summer than in winter. The delicate texture and tender green of the leaves and the pendulous racemes of white fragrant flowers make the whole beauty of this tree, and in winter it seems rough, straggling, and uncouth in its habit of growth, and utterly devoid of either strength or grace. The common locust glories in a wealth of summer sweetness and color, but in winter the absence of poise and symmetry in its branches and its colorless stems make it seem shapeless and dead.

The wood is heavy and strong, and durable when it is placed in contact with the soil. It is used in ship-building and for posts. The bark is a tonic used in homœopathic remedies.

The name, *Robinia*, was given to this genus in honor of Jean Robin, a French botanist, and the gardener of Henry IV. of France. The specific name, *Pseudo-Acacia* (false acacia), arose



COMMON LOCUST TREES

Robinia Pseudo-Acacia

THE LOCUSTS AND YELLOWWOOD

from the supposition that this tree was a species of the Egyptian acacia from its prickly branches and pinnate leaves, which are like those of that tree. It was called "locust tree" by English missionaries who collected it first and fancied that it was the tree that nourished John the Baptist in the wilderness.

It was one of the first American trees to attract attention in Europe, and it has been extensively cultivated there.

The locust is not a native of New England, but it grows wild south of Pennsylvania and it is widely naturalized throughout the United States east of the Rocky Mountains.

The clammy locust (*Robinia viscosa*) is a small tree or shrub easily distinguished from the common locust by its stems and young branches, which are clammy and sticky to the touch. It is a native of the mountains of North Carolina, and it has been extensively cultivated as far north as Eastern Massachusetts.

The specific name, *viscosa*, is from the Latin adjective meaning full of birdlime, sticky, and refers to the peculiar clamminess of the stems.

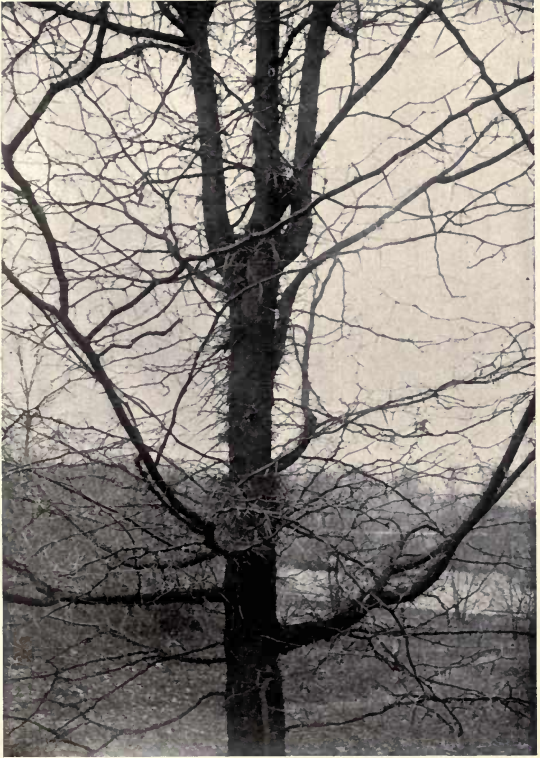
Robinia hispida, the rose acacia, is an ornamental shrub cultivated in gardens and found growing wild from Virginia southward. The specific name, *hispida* (bristly), refers to the

STUDIES OF TREES IN WINTER

long bristles on the branches, leaves, and pods which distinguish this shrub from the other species of the genus.

Honey Locust *A large tree with a smooth*
Gleditsia triacanthos *dark bark, cracking in thick lateral plates on old trees. Long, branching thorns growing in clusters out of the trunk and on the branches. Smooth, shining brown twigs and prominent U-shaped, alternate leaf-scars. There are no terminal buds, and the lateral ones are superposed, inconspicuous, rounded, and partly concealed in the stem. The fruit is a large, pea-like pod, often hanging on the trees through the winter.*

The honey locust is a beautiful tree with a large trunk and wide, loosely spreading branches. It is particularly interesting in winter on account of the apparent absence of buds along the stems. But for the rich brown color of the stems they might be thought dead until a cut with a knife in the stem over the leaf-scars shows the little tender buds tucked away out of sight. It is interesting, too, to find thorns which are long enough to have little thorns branching from them. A straight thorn seems formidable enough even on a rose stem, but a thorn some ten inches long with eight thorns branching from it, each varying from half an



HONEY LOCUST
Gleditsia triacanthos

THE LOCUSTS AND YELLOWWOOD

inch to two inches long, and this but one of a cluster of thorns, keeps the trunk of the honey locust sacred from climbing boys and from browsing cattle. The honey locust is more effective than a barbed wire for fencing. The fruit is in the form of a flat, crooked reddish brown pod from seven to eighteen inches long. These pods are often twisted, and are carried easily by the wind over the top of the snow, and young locusts are propagated in this way at a great distance from the parent tree. Beer has been made by fermenting the inner pulp of fresh pods, but it is more of an experiment than a customary practice.

The wood of the honey locust is hard, strong, and durable when it is placed in contact with the soil; it is used for posts and rails and for making the hubs of wheels.

The generic name, *Gleditsia*, was given to it in honor of Gleditsch, a German botanist; and the specific name, *triacanthos* (three-thorned), refers to the branching thorns.

The honey locust is not native in New England, although it is found growing commonly. Young trees spring up from the seeds of cultivated trees, and in this way it has spread and increased its range. It is found growing wild

STUDIES OF TREES IN WINTER

from Pennsylvania south and west. There are thornless varieties of this tree which are often cultivated.

Yellowwood *A small tree, 20 to 50 feet high. Cladrastis lutea with a smooth dark gray bark, The stems are smooth and brown, with light colored conspicuous leaf-scars in a circle around the subpetiolar buds. The buds are brown and very hairy, each scale being covered with soft brown hairs. Pod-like fruit, about two inches long.*

The clean, smooth bark of the yellowwood, its delicate branches and rich brown stems make this tree attractive in winter, in spite of the fact that, like the locust, its greatest beauty is in its sweet pendulous flowers and bright green leaves. The yellowwood is one of the few trees which have subpetiolar buds, and the prominent leaf-scars encircling the bud show that the base of the leafstalk covered it until the leaf fell off in the autumn.

The wood is used for making gunstocks and for fuel, and it also yields a yellow dye, from which it takes its specific name, *lutea*,—yellow. The generic name, *Cladrastis*, comes from two Greek words meaning brittle branches, and was given to the tree on account of its fragile branches, which are easily broken by the



KENTUCKY COFFEE TREE

Gymnocladus dioica

THE LOCUSTS AND YELLOWWOOD

wind. The yellowwood, or virgilia as it is sometimes called, is extensively cultivated in gardens and it is found growing wild in Kentucky and Tennessee. Professor Sargent says that it is one of the rarest and most local trees of North America.

Kentucky Coffee Tree *A large tree, 50 to 80 feet high, with rough bark. Large cane-like, smooth, gray shoots somewhat roughened by prominent lenticles. Large U-shaped, alternate leaf-scars with three or five bundle-scars. No terminal bud, the lateral buds are (two or three) superposed, they are inconspicuous, very silky to the touch, deep set and surrounded by an incurved rim of the bark. Large, wide, thick pods, 5 to 10 inches long.*
Gymnocladus dioica

The Kentucky coffee tree is entirely destitute of small spray, and in winter its thick, cane-like stems, without any perceptible buds, give it a singular appearance of rigid bluntness. A more striking contrast than the flat, fine sprayed branches of the hop hornbeam and the stout, upright stems of the Kentucky coffee tree could not be imagined. The early settlers in Kentucky made a drink from the seeds of this tree, which they considered equal to coffee, but later when communication with the seaport

STUDIES OF TREES IN WINTER

towns was established they gave up this drink for real coffee, and the seeds have never been used since for that purpose, although the tree has retained its name.

The wood is heavy, but not very strong. It is occasionally used in cabinet making and for posts and rails.

The generic name comes from two Greek words meaning naked branch, and has reference to the stout branches without spray; and the specific name comes from two Greek words meaning of two households, and refers to the male and female flowers which are found on separate trees. The Kentucky coffee tree is found growing wild from New York southward and westward, and it is occasionally cultivated in gardens and parks.

There are one or two other trees belonging to this family which are found planted in gardens. Of these the laburnum (*Laburnum vulgare*), a small tree 10 to 20 feet high, is perhaps the most familiar. It came originally from Switzerland, and has been cultivated in our gardens for its beautiful yellow flowers, "rich in streaming gold." Another member of the family cultivated for its flowers and found wild from New York south and west is the red-bud or Judas tree (*Cercis canadensis*). It is a

THE LOCUSTS AND YELLOWWOOD

small tree with no terminal buds, and with spreading, oval flower buds along the stems, which open before the leaf buds in the spring, and cover the branches with deep-pink flowers.

THE LOCUSTS AND JELLYWOOD

small trees with no terminal buds, and with
leaves and flowers about the same
size as those of the red pine in the
west. The flowers are white.

CHAPTER XI

THE LINDENS, THE LIQUID-
AMBER, AND THE SASSAFRAS



1. The Linden. 2. The Liquidamber. 3. The Sassafras.

Chapter XI

THE LINDENS, THE LIQUIDAMBER, AND THE SASSAFRAS

Families Tiliaceæ, Hamamelidaceæ, and Lauraceæ

THE *Tiliaceæ* are a tropical family with a single genus, the linden, as a representative in our climate. There are two species found wild south of New York besides the common linden, the small leaved basswood and the white basswood, but the common linden and the European linden are the two trees found commonly in New England.

Linden; Bass-
wood *A tall tree, 60 to 80 feet high, frequently excurrent. The bark*
Tilia americana is rather smooth with shallow, close furrows, and the twigs are smooth, with a good deal of color. The leaf-scars are alternate, and the buds are smooth and red, the terminal one often being absent.

The main trunk of the linden frequently extends upwards undivided through the crown to the tip of the tree, with small branches grow-

STUDIES OF TREES IN WINTER

ing from the trunk all the way up. This excurrent characteristic of the linden is especially marked in young trees which have grown in open situations, but even when the trunk has divided into large branches, or has grown in the forest shaded by other trees, and has lost its excurrent shape, the small branches growing directly out of the trunk distinguish it from other trees. The color in the young stems and buds is another means of its identification, and in early spring the deepening color in the twigs from the rising sap, shows that the linden is almost as responsive as the willow to warm rains and sunshine.

The wood is soft and white and close-grained. It is used for carving in the interior finish of houses, and for making wooden ware and cheap furniture. Sugar has been made from the sap, and the inner bark is made into a coarse cordage and matting, and in Europe a coarse cloth is made from it.

The Latin generic name probably comes from *ptilon*, the Greek word for a feather, in allusion to the feather-like bracts on the clusters of the flowers. The specific name, *americana*, was given to our native linden to distinguish it from the European species.

The linden is found growing wild in rich



AMERICAN LINDEN

Tilia americana

THE LINDENS AND LIQUIDAMBER

woods from New Brunswick to Georgia and as far west as Kansas.

The European lindens, or as they are called in England "lime trees," may be distinguished from our linden by their twigs, which are more numerous and more slender than those of our species. The linden has long been a favorite tree for formal effects, both in Europe and in this country. "The French," Du Hamel says, "growing tired of the horsechestnut for avenues, adopted the lime for that purpose, in the time of Louis XIV., and accordingly the approaches to the residences of the French, as well as the English gentry of that date are bordered with lime trees." Since the day of the modern school of landscape gardening the linden is not nearly so much planted as it used to be.

A successful experiment has been tried in Germany of making table oil from the seeds of this tree. A paste like chocolate has also been made from the fruit, but it does not keep. The family name of Linnæus, the famous botanist, was originally derived from *linn*, the Swedish name for the linden, a large tree having always stood by the old family home-
stead.

The European lindens are not so well suited

STUDIES OF TREES IN WINTER

to our climate as our native basswood, but it seems to be more generally planted in our city streets, in spite of this fact.

The *Hamamelis* family is a small order of trees and shrubs with two genera in the United States,—the *Hamamelis* and *Liquidambar*; each genus has but one species.

Liquidamber; *A large tree, 30 to 150 feet*
Sweet Gum *high, with deeply furrowed bark.*

Liquidambar Styra- *The twigs are covered with corky*
ciflua *ridges. The leaf-scars are alter-*
nate. The buds are reddish in color and smooth.
The pith is in the form of a pentagon when the
twig is cut across. The fruit is a round, dry,
open, rough catkin hanging on the tree through
the winter.

The liquidamber is at all times beautiful, and in winter the broad, corky wings along the twigs give it a singular appearance, adding much to one's interest in the tree. It is unusual to find so much color in corky ridged stems as in those of the liquidamber. The stems of the cork elm and the mossy cup oak have these peculiar corky layers, but neither of them have smooth, polished stems between the broken ridges, nor such radiant color as those of the liquidamber. When this tree



LIQUIDAMBER
Liquidambar Styraciflua

THE LINDENS AND LIQUIDAMBER

grows in open situations its trunk divides a short distance from the ground, and the branches form a pyramidal head. In moist Southern forests, however, where the liquidamber grows to be very tall, its trunk is straight, a uniform size in diameter, and often undivided into branches to the height of seventy or eighty feet. Michaux describes a liquidamber which he found growing in a swamp in Georgia, which measured fifteen feet and seven inches in circumference at five feet from the ground, and these trees sometimes grow to be over 150 feet high when the conditions are favorable to their growth.

The wood is heavy and close-grained and is used in cabinet making, for fruit boxes, and for the outside finish of houses. Professor Sargent says that the future supply of the wood is reasonably certain from the fact that the real home of this tree in those parts of the country where it attains its greatest development is in deep swamps, always inundated every year during several weeks at a time, and incapable of being drained and cultivated. The generic name, *Liquidambar*, from *liquidus* (liquid), *ambar* (amber), was given to this tree by Linnæus in reference to the fragrant juice which exudes from its stems. It is sometimes

STUDIES OF TREES IN WINTER

collected and used as an ointment in medicine. The flow of resinous balsam increases according to the warmth of the climate in which the liquidamber is found. The specific name, *Styraciflua*, from the Latin word *styrax* (storax), also alludes to this juice, storax being a resinous gum.

The liquidamber is found growing in Fairfield County, Connecticut, and from there southward to Florida and westward. It grows well in gardens in the neighborhood of Boston; but it is liable to suffer after severe winters throughout Eastern New England.

The witch-hazel (*Hamamelis virginiana*) is a small tree or shrub, 10 to 30 feet high, with a smooth brown bark and flat branches, covered through the winter with woody fruit capsules. It is found on the borders of moist woods throughout New England and its profusion of yellow thread-like flowers in the bare November woods make it a striking object in autumn. The combination on a single tree, at the same time, of blossoms and ripe fruit is unusual in any climate, and the witch-hazel is the only example of it in the Northeastern States. Linnæus gave it the Greek name *hamamelis*, which means bearing flowers together with the fruit.



SASSAFRAS

Sassafras variifolium

THE LINDENS AND LIQUIDAMBER

The Indians were the first to use the bark for curing inflammations, and its medicinal virtues have long been recognized, in spite of the fact that chemists consider that it has no active medicinal properties. On the slopes of some of the southern mountains the witch-hazel becomes a small tree, although we are accustomed to find it a rather straggling shrub in our New England woods.

The *Lauraceæ* are an order of aromatic trees and shrubs found chiefly in the tropics; of trees there is a single genus of a single species found in New England, — the sassafras.

Sassafras *A tree common in rich woods.*
Sassafras variifolium It is 15 to 100 feet high, with a rough bark and twisted branches. Green twigs, smooth and sweet scented, with an aromatic mucilaginous juice. Large buds; semi-oval, semicircular, alternate leaf-scars. The flowers come a little before the leaves unfold. The aromatic fragrance is strongest in the bark of the roots.

Few trees are more interesting in winter than the sassafras. The color of their smooth, bare stems is an exquisite shade of green, the terminal buds are large for the size of the slender twigs and tiny leaf-scars, and the deli-

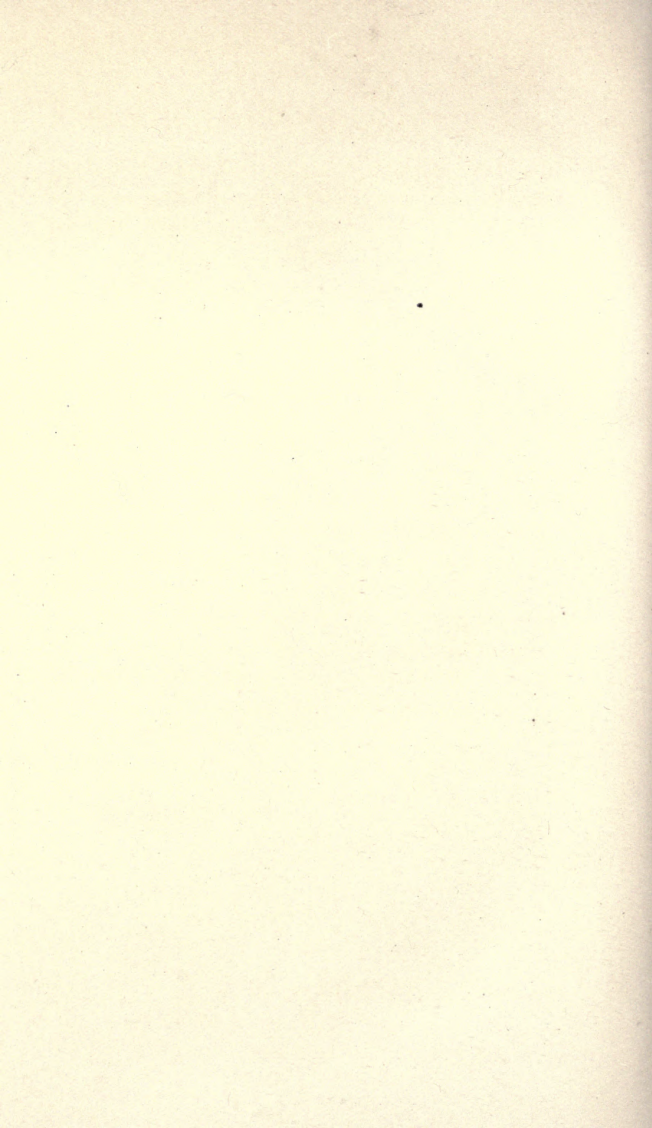
STUDIES OF TREES IN WINTER

cious, aromatic taste and fragrance when the twigs are broken are most unusual. The branches often have a curious spirally twisted appearance, a corkscrew effect, which with the rough bark of the trunk give the tree an ancient weather-beaten aspect when it is comparatively young. The sassafras was one of the first American trees which became known in Europe. In the middle of the sixteenth century the French in Florida were told by the Indians about its curative properties, and from that time it was sought after, — sassafras roots having formed a part of the first cargo exported from Massachusetts. J. C. Loudon, an English writer on trees sixty years ago, had an original theory, that the discovery of America was largely due to the sassafras. "It was its strong fragrance smelt by Columbus," he says, in the third volume of his "Arboretum," "that encouraged him to persevere when his crew mutinied, and enabled him to convince them that land was near at hand."

Thoreau in his walks through the winter woods about Concord in February says: "When I break off a twig of green-barked sassafras, as I am going through the woods now, and smell it, I am startled to find it as fragrant as in summer. It is an importation of all the



TRUNK OF A SASSAFRAS



THE LINDENS AND LIQUIDAMBER

spices of Oriental summers into our New England winter, very foreign to the snow and the oak leaves." This Oriental spiciness may be partly accounted for by the fact that our sassafras is related to the camphor and cinnamon trees of the tropics.

The wood is soft and brittle, but it has durability when placed in contact with the soil, which makes it useful for posts and rails. It is also used for ox yokes and cooperage. Oil of sassafras, which is distilled from the bark of the roots, is used for perfuming soap. This tree is confined to eastern North America, and deserves far more attention than has been given it by landscape gardeners, — it is a beautiful tree as well as an individual one.

Sassafras was a popular name used by the French in Florida, and it was once both its generic and specific name.

CHAPTER XII

THE MAGNOLIA AND TULIP TREE,
THE CATALPA, THE AILAN-
THUS, AND THE ARALIA



The Magnolia and the Tulip-tree.

Chapter XII

THE MAGNOLIA AND TULIP TREE, THE CATALPA, THE AILANTHUS, AND THE ARALIA

Families Magnoliaceæ, Bignoniaceæ, Simaroubaceæ, and Araliaceæ

THE magnolia family is made up of trees and shrubs belonging mainly to the tropics, but it has two genera in the Northeastern States,—the magnolia and the tulip tree. They are particularly interesting in winter on account of the buds which are covered with stipules forming bud-scales and which protect the undeveloped leaves until they open in the spring.

There are six species of magnolia in the United States, but only one is found growing wild in New England. The tulip tree is the only species in the genus *Liriodendron* and it is found only in eastern North America and western China.

Swamp Magnolia; Sweet Bay
Magnolia virginiana

A shrub or slender tree, 4 to 30 feet high, with light brown bark. The recent shoots are a bright green, and like the buds they have a tendency towards downiness. Alternate leaf-scars.

STUDIES OF TREES IN WINTER

This magnolia is found growing more or less commonly in swamps from New Jersey to Florida, but it is rare in the north. Over a hundred years ago it was discovered growing wild in Essex County, Massachusetts, by a minister of Ipswich, the Rev. Manasseh Cutler, and it is still found in the swamps near Gloucester. It is a low shrub in the north, but in the south it grows to be a slender tree. The wood which is soft and light is occasionally used in the south for making broom handles. The roots of the swamp magnolia are very fleshy, and they used to be eaten by beavers. The early settlers in Pennsylvania called it the "beaver tree" and baited their traps to catch beavers with pieces of the roots.

The name was given to the genus in honor of Pierre Magnol, a professor of botany at Montpellier in the seventeenth century, the former name, *glauca* (glaucous) referred to the bloom on the under side of the leaves.

The umbrella tree (*Magnolia tripetala*) is found much more commonly in parks and gardens than our native swamp magnolia, and it seems a better representative of the genus for illustration. In the south it grows to be thirty or forty feet high. The bark is light gray in color and covered with small, blister-like ex-

THE MAGNOLIA AND TULIP TREE

crecences. The branches are stout, and green in color turning to brown. The buds are large and smooth and covered with a purplish, glaucous bloom, and the leaf-scars are clearly defined. This magnolia grows in deep, rich moist soil, and is nowhere common. It is more frequently cultivated than any of the other species.

The name, *tripetala*, was given to it by Linnæus, and refers to the three conspicuous sepals of the flowers. The English name alludes to the spreading umbrella-like arrangement of the leaves.

The cucumber tree (*Magnolia acuminata*), a large tree 50 to 90 feet high, grows wild in western New York and southward, and is often cultivated. Its leaf buds are silky. The specific name refers to the pointed apex of the leaves.

Tulip Tree *A very large tree, 80 to 150 feet*
Liriodendron Tulipifera *high. The bark is dark and*
smooth, with small shallow fur-
rows. The twigs are light purplish brown, with
a grayish bloom, and the leaf-scars are oval and
alternate in arrangement. The terminal bud is
covered by two stipules. There are stipule-scars on
the stems. The fruit is a pointed, open, dry cone,
often remaining on the trees through the winter.

STUDIES OF TREES IN WINTER

The tulip tree is one of the largest and tallest trees in our American forests. It has long been admired for its beauty in the summer, and a study of its winter buds and stems discloses the fact that it is equally interesting and beautiful when its foliage has gone. The buds are peculiar in structure. Each leaf within the bud is protected by a pair of stipules, and in the spring, when the buds open, a leaf slowly uncurls from its two folded stipule coverings and another bud is seen beneath, wrapped in stipules. This bud unfolds and in its turn discloses another. The process is as fascinating to watch as the opening of Indian boxes one within another. This characteristic of the tulip tree in protecting its young leaves makes one associate a very human, maternal instinct with the tree; it seems of all others the most careful in protecting its young growth. Sir John Lubbock, in his work on "Buds and Stipules," explains that the peculiar squared end of the tulip tree's leaf is caused by the singular way it is folded in the bud.

"I long wondered," he says, "what could be the purpose or the advantage to the tree of this remarkable shape. One idea which occurred to me was that the difference of form might enable insects to perceive the tree at some dis-



TULIP TREE
Liriodendron Tulipifera

THE MAGNOLIA AND TULIP TREE

tance, just as the colors of flowers are an advantage in rendering them more conspicuous. I then looked closely to see whether the peculiar forms could in any way be explained by the position of the leaves on the tree. I believe, however, that the cause is of a different nature, and has reference to the peculiar character of the bud. Each young leaf is, as in the family *Magnoliaceæ* generally, originally enclosed in and sheltered by the stipules of its predecessor. These are in *Liriodendron* oval or in form resembling a shallow dish or spoon, so that when placed face to face they form a hollow almond-shaped box. Inside this lies the next younger pair of stipules; and the rest of the space is occupied by the young leaf, which is conduplicate or folded on itself down the middle, like a sheet of note paper, and also turned back towards the base of the bud. This unusual position is probably due to the early development of the petiole. It seems obvious that the peculiar form of the leaf is due to the form and arrangement of the bud."

The wood, which is known as whitewood and yellow poplar, is very valuable. It is light and easily worked, and is much used for furniture and in the interior finish of houses. The bark of the wood and branches is pungent, bit-

STUDIES OF TREES IN WINTER

ter, and aromatic, and acts on the system as a tonic. According to Bigelow's "Medical Botany" it has been used in the treatment of chronic rheumatism and in intermittent fever.

The generic name comes from two Greek words meaning tulip tree, and alludes to the tulip-like flowers; the specific name also refers to the flowers, and means tulip bearing.

The tulip tree is found growing wild in Rhode Island and Vermont, south to Florida, and westward. It is planted commonly throughout New England. This tree was found growing in Western China in 1875, and in 1889 specimens were sent to England and it was found to be identical with the American species.

The family *Bignoniaceæ* (named for the Abbé Bignon) is an order of woody plants found abundantly in South America. It has a single representative genus cultivated in the Northern States and found wild in the South,—the catalpa. There are two species, the common catalpa and the hardy catalpa, the latter being the most desirable for planting.

Hardy Catalpa; *A tall tree, 60 to 80 feet high,*
Indian Bean *with a thick, slightly furrowed*
Catalpa speciosa *bark. Smooth, gray, coarse,*
stiff twigs. Oval leaf-scars arranged in whorls



CATALPA
Catalpa speciosa

THE MAGNOLIA AND TULIP TREE

of three on the stem, or opposite each other. The buds are short and inconspicuous, with loose scales. The fruit is in long pods, hanging on the tree till spring.

The catalpa is an attractive tree in winter on account of the long slender pods which hang from the tips of the branches, and give the stout stems a light effect otherwise lacking, for taken alone they are coarse and bluntly moulded and very rigid. The name catalpa comes from an Indian word meaning winged head; and as the catalpa has dense, heavy foliage in summer and suggests solidity rather than the light effect "winged" conveys to one's mind, it is just possible that the Indians referred to its winter aspect when they gave it the name. The buds open very late in the spring, giving the tree a lifeless appearance long after other trees are green.

The value of the catalpa as a timber tree is fast becoming recognized. It grows rapidly, with an average increase of an inch a year in the diameter of the trunk, and the wood is very durable in contact with the soil; when used for railroad ties it has been known to remain sound for over twenty years. Its practical value is shown by the experience of an Illinois farmer who planted five hundred acres of these

STUDIES OF TREES IN WINTER

trees, and after eight years' growth thirteen thousand posts were cut and sold for thirteen hundred dollars, and the remaining trees were improved rather than harmed by this thinning out.

The Latin name, *speciosa* (well-formed), refers to the beautiful flowers of this tree. The catalpa grows wild in the Middle West, and is cultivated commonly in parks and gardens in the Northeastern States.

The *Simaroubaceæ* family is a small order of trees and shrubs found in the South, with one genus in the North, a cultivated and widely naturalized tree, — the ailanthus from China.

Ailanthus; *A large tree, with gray bark.*
Tree of *Very large, coarse twigs with*
Heaven *brown pith. Large alternate leaf-*
Ailanthus glandulosa *scars, V-shaped, or heart-shaped,*
with numerous bundle-scars. The buds are
small, round, and inconspicuous, and covered
with two scales. The terminal buds are lacking.
The fruit is winged, like that of the ash, but its
seed is in the centre. The dry clusters of fruit
hang on some trees through the winter.

The ailanthus, like the Kentucky coffee tree, is destitute of small spray among its branches, but it would never be confused with that tree



AILANTHUS
Ailanthus glandulosa

THE MAGNOLIA AND TULIP TREE

on account of its smooth bark, which is a great contrast to the roughly ridged bark of the Kentucky coffee tree. Its stems are smooth and thick, and the large leaf-scars are much more prominent than the buds. Its large, pinnate leaves, often over four feet long, make the ailanthus decorative in summer, but its coarse stems in winter diminish its æsthetic value in landscape gardening. It grows very fast at first, its leading stems sometimes reaching over six feet in a single season; but after ten or twelve years this rate decreases and it advances with moderate growth.

In America it is planted only as an ornamental tree, but its wood is fine-grained, hard, and takes a good polish, and is well fitted for cabinet making.

The generic name was originally spelled *ailantus*, and came from *ailanto* (tree of heaven), the name of this tree in the Moluccas; its name was undoubtedly given to it on account of the rapidity of its growth and the great height it reaches in its native country. The specific name, *glandulosa* (glandulous), refers to the margins on the under side of the leaves.

The ailanthus originally came from China, but it has become naturalized here, and is planted very commonly in city streets, along

STUDIES OF TREES IN WINTER

country roads, and in parks and gardens. It was first brought to the United States by Mr. William Hamilton in 1784.

The family *Araliaceæ*, well known by its herb members, the ginseng and wild sarsaparilla, has one tree-like representative,—the aralia.

Angelica Tree; *A shrub or low tree, 8 to 30 feet*
Hercules' Club *high. Coarse, stout stems, covered with large prickles. The*
Aralia spinosa *alternate leaf-scars are narrow and project from the stem and almost encircle it. The bundle-scars are near together and conspicuous. The buds are covered with loose scales and are small for the size of the stems. The white pith in the stems is conspicuous when they are cut.*

Among all trees and shrubs the aralia is unique in winter. Its stout, club-like stems, thickly beset with prickles, are so large they never fail to attract attention, and whatever lack of beauty there may be is overlooked owing to their grotesque aspect. In our Northern gardens it is only a shrub, but it invariably arouses curiosity and seems to compel attention more than trees three times its size.

The bark of the root and the berries are occasionally used in medicine as a stimulant.



HERCULES' CLUB
Aralia spinosa

THE MAGNOLIA AND TULIP TREE

The meaning of the generic name is unknown. The specific name, *spinosa*, is the Latin word meaning prickly, and alludes to the stems.

Southward from Pennsylvania this curious, ungainly tree is found growing wild, and as it is hardy in the North it is frequently cultivated in gardens. It is seen at its best in the rich soil of the Big Smoky Mountains of Tennessee. There it grows to be thirty or thirty-five feet high, with wide-spreading branches and a true arborescent habit.

THE MAGNOLIA AND TULIP TREE

The meaning of the generic name is in fact the specific name, known as the Latin and meaning "magnolia" and allude to

and from Louisiana this name is used to denote the tree in that state.

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CHAPTER XIII

THE APPLE TREE, PEAR TREE,
MOUNTAIN ASH, CHERRY TREE,
AND THE SHAD BUSH



MOUNTAIN ASH
Pyrus americana

Chapter XIII

THE APPLE TREE, PEAR TREE, MOUNTAIN ASH, CHERRY TREE, AND THE SHAD BUSH.

Family Rosaceæ

THE rose family is a very large order of trees, shrubs, and herbs belonging to temperate climates. There are numerous genera, including valuable fruit and ornamental trees which have been cultivated since the earliest times. Many of the species are so familiar that they scarcely need description in summer, but in winter the character of their buds and stems is less easily recognized, and unless the trees are well grown it is sometimes difficult to identify them.

Common *A flat-topped tree, 20 to 40 feet*
Apple Tree *high. The bark of the tree scales*
Pyrus Malus *off in small, thin, brittle plates.*
The buds and the stems are small and somewhat woolly. The leaf-scars are alternate and inconspicuous, with three bundle-scars.

STUDIES OF TREES IN WINTER

The low, flat-topped, broad-headed shape of the apple tree is so characteristic that it may be easily recognized in winter, even when there is no surrounding orchard to identify it. So strong in one's mind is the association of blossoms with these trees, that even a bare old apple tree against a winter sky suggests the spring, — an apple tree always seems to be haunted by the ghosts of its pink blossoms. The literary history of this tree goes back to the mythologies of the Greeks, the Scandinavians, and the Druids, and it also figures prominently in early Christian as well as pagan legends. It has been cultivated for its fruit since prehistoric times, and there are hundreds of varieties of it in cultivation.

The wood is fine-grained, hard, and a rich reddish brown color. It is used for small purposes in turnery. The fruit, however, is the most valuable product of the tree, and cider has been made from it for hundreds of years. Its native country is uncertain, but it is probably indigenous to the Northwestern Himalayas and the forests along the Black Sea. It was introduced into Britain by the Romans, and it is widely naturalized in the United States.

The generic name, *Pyrus*, is the ancient classical name for the pear tree, and probably

THE APPLE AND PEAR TREES

was originally taken from the Celtic word *peren*, from which the English word was derived. The specific name, *Malus*, is the ancient classical name for the apple tree.

Common Pear Tree *A pyramidal tree, 30 to 70 feet high. The bark is smooth, and the branches incline to be thorny, especially when the tree has escaped cultivation. Smooth stems and small pointed buds. Alternate inconspicuous leaf-scars, with three bundle-scars.*
Pyrus communis

As distinctive in shape as the apple tree, but in striking contrast to it, the erect pyramidal head of the pear tree is easily recognized in winter, and its small, pointed buds and smooth stems offer other points of difference. Like the apple tree, the pear tree has been in cultivation for hundreds of years and there are innumerable varieties. It seems incongruous that so small a tree should live to a great age, but Bosc alludes to pear trees more than four hundred years old, and Knight tells of several which date back to the fifteenth century.

The wood is heavy and compact, and is used in Europe by wood engravers and turners. A drink called perry is made from pears in much the same way that cider is made from apples. It was considered an antidote to mushroom

STUDIES OF TREES IN WINTER

poisoning by the Romans, and in England it is still taken, "after a surfeit of that vegetable," according to Loudon. The pear tree is a native of nearly all the elevated regions of Europe and Western Asia. Like the apple tree it was introduced into Britain by the Romans, and it is widely naturalized in the United States.

Mountain Ash, or Rowan Tree *A slender tree, or tall shrub, 20 to 30 feet high. Slender spreading branches with smooth bark. *Pyrus americana**
The twigs are downy, becoming smooth and brownish red in color. Large alternate leaf-scars. The buds are pointed, reddish in color, and gummy to the touch. The inner scales of the buds are coated with down. It has bright scarlet berry-like fruit, which remains on the tree through the winter.

The mountain ash is seldom associated in our minds with apple and pear trees, but it belongs to the same genus nevertheless, and has absolutely nothing in common with the ash tree, as one might suppose. The American mountain ash is frequently planted as an ornamental tree, although the European species is more often cultivated than ours. The buds of the European mountain ash are blunter and more downy than those of the American, the



A YOUNG BLACK CHERRY TREE
Prunus serotina

THE APPLE AND PEAR TREES

bark is lighter in color, and the berries are larger, but apart from these differences the trees can scarcely be told apart in winter.

Pyrus sambucifolia, the elder-leafed mountain ash, is another native species which grows wild in the mountains of Northern New England and is found as far north as Greenland and westward. The range of *Pyrus americana* is more limited, but it is found from Newfoundland to North Carolina and westward.

Wild Black Cherry *Prunus serotina* *A tree or shrub, varying from 15 to 100 feet high. The bark is smooth on young trees, with conspicuous horizontal lenticels; on old trees it cracks and breaks off in small, thin, brittle scales. The branches are slender, rigid, reddish brown in color, and bitter to the taste. The buds are pointed, a light chestnut brown in color, with closely overlapping scales. Alternate leaf-scars.*

The black cherry may be identified in winter by its bark and by the disagreeable bitter taste of its stems,—no other tree has a strong, peculiar, pungent taste like this. The bark of the young trees is really beautiful, it is so smooth and has such a rich reddish brown color; in some characteristics it resembles that of the black birch, but the larger, coarser lenticels distinguish it from that tree.

STUDIES OF TREES IN WINTER

The black cherry is a valuable timber tree. The wood is light, strong, and hard, and takes a fair polish. It is used in cabinet making and for the interior finish of houses. The bark of the branches and roots is much used in medicine, and the ripe fruit is used to flavor alcoholic liquors.

The meaning of the generic name, *Prunus*, is unknown, but it is thought to be of Asiatic origin. The specific name, *serotina* (late flowering), refers to the blossoms of this tree, which appear in June, later than those of other cherries. It is found from Nova Scotia to Florida, and reaches its greatest size in the Western forests.

Prunus virginiana, the choke cherry, and *Prunus pennsylvanica*, the wild red, bird, or pin cherry, are two small trees found more or less frequently in the woods throughout the Atlantic States. They are both distinguished from the black cherry by their red instead of black fruit.

The common sweet cherry (*Prunus avium*), the common peach tree (*Prunus Persica*), and the common garden plum (*Prunus domestica*) all belong to this genus and are widely cultivated in the United States. They are small trees with many varieties and are planted for their fruit.

The cherry was brought from Asia to Italy,

THE APPLE AND PEAR TREES

and from there it was rapidly carried to all parts of Europe. The peach came originally from China, and was brought to Great Britain by the Romans, who got it from Persia during the reign of the Emperor Claudius. It was carried to North America by the first settlers at the beginning of the seventeenth century. The difficulty of raising peaches successfully in the Northern States is not so much due to the cold weather as to the swelling of the buds on warm winter days and in the early spring, which are afterwards destroyed if the thermometer goes below zero. An interesting experiment of whitewashing peach trees, to prevent the buds from absorbing heat on sunny days, was tried by Mr. Whitten of the Missouri Experiment Station, and it was found that whitened buds remained dormant until April, while unprotected buds swelled perceptibly in February and March. Eighty per cent of whitened buds passed the winter safely, where only twenty per cent of unwhitened buds escaped injury by premature swelling.

Shad Bush; Ser-
vice Berry;
June Berry

Amelanchier canadensis

A small tree, 40 to 50 feet high, with smooth brown bark. Slender twigs. The buds are brown and covered with slightly downy, silky scales, and the leaf-scars are alternate.

STUDIES OF TREES IN WINTER

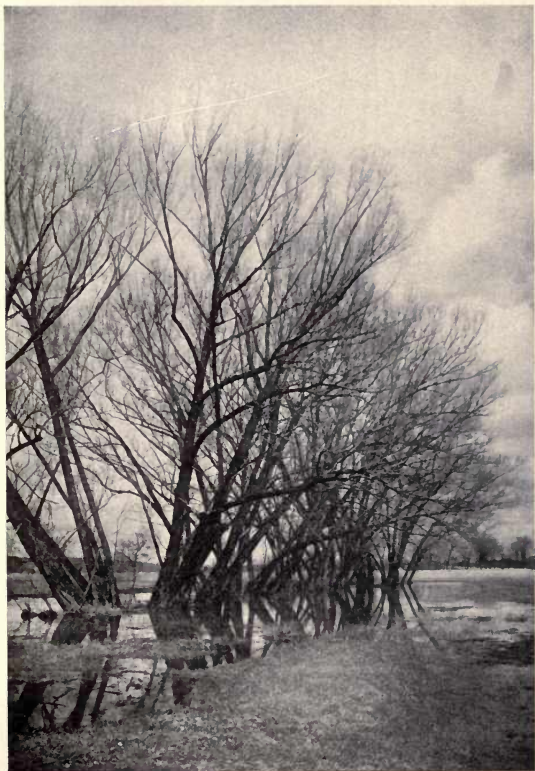
The shad bush is strongly associated with the rich upland woods of New England, and in the early spring its white flowers are among the first to appear among the budding trees and shrubs, when the streams are full and the shad begin to rise. In winter there are no marked characteristics by which it may be known, apart from its general resemblance to other genera in the family, and its delicate twigs, small pointed buds with overlapping scales, and inconspicuous leaf-scars.

The wood is close-grained, heavy, and exceedingly hard, and is used for the handles of tools and other small implements.

The generic name, *Amelanchier*, is the Savoy name for the medlar. The shad bush is found from Newfoundland to Northern Florida and westward.

CHAPTER XIV

THE WILLOWS AND POPLARS



WHITE WILLOWS
Salix alba

Chapter XIV

THE WILLOWS AND POPLARS

Family Salicaceæ

AMONG the willows there are so many hybrids and varieties that their classification is difficult even in summer when an analysis of the flowers is possible. Most of the species in the Eastern States are shrubs, and I have chosen the only large tree, the white willow, as a representative species for study in winter. The genus *Populus* also belongs to this family, of which four species grow commonly in New England.

White Willow *A large tree, 50 to 80 feet high, with thick, rough bark and lithe branches. The twigs are smooth and often yellow in color, and the small alternate leaf-scars have three bundle-scars. The buds are pointed, covered with a single scale and placed close against the stems. The lateral buds are numerous and are usually larger than the terminal buds.*

The white willow is really a native of Europe, but for generations in New England it has

STUDIES OF TREES IN WINTER

associated itself with country landscapes, and there is scarcely a marshy meadow or a stream through a pasture with a water course unmarked by a row of these trees. It seems wonderful that the buds of willows should survive our cold Northern winters as they do, for they are covered with a single scale of delicate texture, and the little undeveloped leaves seem perilously near the cold. The soft woolly catkins of some species, — “the pussy willows,” — which come before the leaves, carry their own protection from cold weather, and even in January, when a few warm days bring them out prematurely, they look comfortable; but the little leaves with their single coverings never come out before the right time, and they never appear to have suffered.

The wood is weak and soft, and little use is made of it. The value of the twigs in basket making has been recognized since early Roman times, Cato having ranked the *salictum*, or willow field, next in value to the vineyard and the garden.

The generic name comes from the Celtic words *sal*, near, *lis*, water, in allusion to its aquatic nature. It grows on all kinds of soil, and is widely naturalized in the United States.

The weeping willow (*Salix babylonica*) is

THE WILLOW AND POPLARS

planted in gardens and may be distinguished by its very slender, long drooping branches, which in every limb suggest the sentiment of a hundred years ago. In allusion to its place among other trees in landscape composition, Mrs. Van Rensselaer says in "Art Out of Doors":—

"As soon as we see a weeping willow it almost shouts out its contrast to the simpler shapes of the trees which determine the general character of all our landscapes or garden pictures. Yet we see it everywhere, in every kind of situation.

"In all my wanderings I never once have seen it rightly placed; I never once have seen it where it did not hurt the effect of its surroundings, or, at least, if it stood apart from other trees, where some tree of another species would not have looked far better."

The black willow (*Salix nigra*) is the only one among our native willows which grows to a good size, but even this is seldom more than thirty feet high.

Aspen; American Aspen *Populus tremuloides* *A medium sized tree, 30 to 60 feet high, with a smooth, greenish gray bark and tapering trunk. The twigs are slender. The buds are long, sharp-pointed, with smooth, glossy scales covered with a gummy substance. Alternate leaf-scars.*

STUDIES OF TREES IN WINTER

The aspen is more conspicuous in summer, when the constant motion of its trembling leaves attracts our attention, than it is in winter, although in some trees the smooth, olive-green bark of the trunk is very attractive, particularly in contrast with the snow. There have been endless allusions in literature to the European aspen, which resembles our species. In a simile showing the activity of Penelope's maidens, Homer says: —

“Some ply the loom; their busy fingers move
Like poplar leaves when zephyr fans the grove.”

Again Spenser uses the same simile: —

“His hand did quake
And tremble like a leaf of aspen green.”

And Sir Walter Scott uses it in the same way to picture quick changes of facial expression: —

“With every change his features played,
As aspens show the light and shade.”

Gerard, in a way scarcely flattering to the sex, compares the leaves to women's tongues, “which seldom cease wagging;” but Sir Walter Scott restores the balance in the lines: —

“O woman! in our hours of ease
Uncertain, coy, and hard to please,
And variable as the shade
By the light quivering aspen made,
When pain and anguish wring the brow,
A ministering angel thou.”



ASPENS
Populus tremuloides

THE WILLOW AND POPLARS

The wood is close-grained, soft, and not strong, but it is made into pulp and used in the manufacture of paper. The bark is brittle, with a taste like quinine, but the inner bark is sweet, and in the spring it is used as food by the Indians.

The generic name, *Populus*, is supposed to have come from the Latin *arbor populi* (the tree of the people), because rows of this tree were always planted in public places about Rome. The specific name, *tremuloides*, refers to the leaves which tremble continually on account of their long, flattened, pliable leaf-stalks. The aspen grows wild throughout the Northern United States and in the mountains of Lower California and Mexico.

**Large-toothed
Aspen**

*Populus grandiden-
tata*

A large tree, 60 to 80 feet high, with smooth greenish gray bark.

The buds are conical with somewhat downy scales and spread at right angles from the stem. Slender twigs and alternate leaf-scars.

This tree is quite distinct from the American aspen, although it is often confounded with it. It is found much less frequently than the American aspen.

The wood is close-grained, soft, and light, and is used for making wood pulp and wooden

STUDIES OF TREES IN WINTER

ware. In old times when it was the fashion for women to wear high-heeled shoes this wood was used in making heels, as it was light and best adapted to the purpose.

The specific name, *grandidentata* (large toothed), refers to the serrations of the leaf, which are much coarser than those of the American aspen.

Balm of Gilead; Balsam Poplar
Populus balsamifera

A tall tree, 40 to 70 feet high. The bark is smooth and greenish gray, often roughly ridged at the base of the trunk. Large buds with overlapping scales covered with a sticky, yellow, glutinous substance. Conspicuous alternate leaf-scars.

In the early spring, when the sun has melted the gummy resin which covers the buds of the balm of Gilead, one can tell the tree blind-folded by its sweet, pungent perfume, and even in winter the buds have this same strong, medicinal, aromatic odor which serves as a means of recognizing the tree.

Pallas says that when grouse and other birds of that family feed on the buds of the balm of Gilead during the winter, their flesh becomes imbued with the balsam flavor, which he seems to think adds to the relish of the meat as food.

This tree grows very fast on almost any kind

THE WILLOW AND POPLARS

of soil, and its roots extend to a great distance. Emerson found a balm of Gilead the roots of which had passed under a house forty feet wide and thrown up suckers on the other side.

The wood, like that of other poplars, is soft and light and is used in making paper pulp, pails, and boxes.

The specific name refers to the balsam on the buds. The balm of Gilead is found in the Western and Eastern States.

Cottonwood; *A large tree, 80 to 100 feet*
Necklace or *high. The bark is dark gray*
Carolina *and more broken in fissures than*
Poplar *that of other poplars. The buds*
are glossy and resinous, but have less balsam than
those of the other species. Alternate leaf-scars.
Conspicuous five-angled pith in the small stems.

The cottonwood is larger than the other poplars, and in the Mississippi Valley it sometimes grows to be one hundred and fifty feet high. The climate of London must be particularly congenial to this tree, for Emerson alludes to trees there which grew thirty and forty feet in only seven years. In England it is called the black Italian poplar. The name necklace poplar comes from the resemblance of the fruit of the catkins to the beads of a necklace.

STUDIES OF TREES IN WINTER

The wood is light and soft, and is used for pulp, for making packing cases, and for fuel.

The specific name, *deltoides*, comes from the Greek, and alludes to the deltoid or triangular shape of the leaves. The cottonwood grows wild in Western New England, south to Florida and westward.

Beside these four poplars, the swamp cottonwood (*Populus heterophylla*) is found growing wild at one place in Connecticut, and the Lombardy and white poplars are both planted commonly from Europe.

The erect, rigid branches of the Lombardy poplar and its general narrow, spire-like growth make the outline of this tree so distinctive that it is easily recognized, even in winter, at a great distance. The buds are gummy, and the bark of the trunk is deeply fissured. It is a tall tree, often reaching one hundred and twenty feet high.

The white poplar may be distinguished by its buds, which are not covered with sticky coating like those of the other members of this genus, and by the recent shoots, which are downy. It is remarkable in summer for the thick, white down on the under sides of the dark green leaves, producing a most pleasing contrast in the foliage when the wind blows.

CHAPTER XV
THE LARCH



AMERICAN LARCH

Larix laricina

Chapter XV

THE LARCH

Family Pinaceæ

THE larch is the only native Northern genus of the pine family which loses its leaves in winter; all the other native genera are evergreens. There is one indigenous species, and one from Europe which is cultivated even more commonly than the American tree.

American Larch; Tamarack or Hackmatack <i>Larix laricina</i>	<i>A large tree, 50 to 100 feet high. The bark is rough with small, flat scales. The stems are pliable, and are covered with knobby buds. The cones are small, not more than half an inch long.</i>
---	---

In Massachusetts the larch does not attain a great height, but in cold Northern swamps it grows to be a large tree. It is not dependent on a wet situation, but grows well after being transplanted into upland soil. Its growth is rapid, and it is often chosen for "quick effects" in landscape gardening, — a choice which is to be regretted for the most part, as few trees have so little beauty as the larch.

STUDIES OF TREES IN WINTER

During a brief interval in the early spring, when the first young leaves fringe the branches in delicate green, this tree is really lovely, but after that there is little to attract us in its stiff, formal outline and dark foliage, and in winter it is most unprepossessing.

The wood is heavy, hard, strong, and very durable. It is used for the knees of vessels and ship timbers, for posts, telegraph poles, and railway ties.

The generic name, *Larix*, comes from the Celtic word *lar*, meaning fat, and was given to this genus on account of the resin produced by the tree. The larch is found throughout the Northeastern States.

European	<i>A large tree, 80 to 100 feet high.</i>
Larch	<i>The branches are more pendu-</i>
<i>Larix decidua</i>	<i>lous, and the cones are twice as</i>

large as those of our native species.

The cones of both the American and European larches hang on the branches through the winter, and as those of the European are an inch or more long and about as broad, while those of the American are half that size, the trees are easily distinguished from each other. Even in the accompanying photographs this difference is discernible.

At one time in England the plan of intro-



EUROPEAN LARCH

Larix decidua

THE LARCH

ducing the larch into the forests bordering the English lakes was under consideration, and this greatly disturbed the poet Wordsworth, who was keenly alive to the distressing effects of inharmonious and inappropriate tree planting. In "A Description of the Scenery of the Lakes," he points out the fact that it is impossible for trees which terminate in a spike, like that of the larch, to blend together and form masses of wood; that if thousands to tens of thousands are added, the appearance is still the same, a collection of separate individual trees, obstinately presenting themselves as such, and which, from whatever point they are looked at, if but seen may be counted upon the fingers. He goes on to express his dislike of the larch in the following words "As a tree it is less than any other pleasing; its branches (for boughs it has none) have no variety in the youth of this tree, and little dignity even when it attains its full growth; leaves it cannot be said to have, consequently it affords neither shade nor shelter. In spring the larch becomes green long before the native trees, and its green is so peculiar and vivid that, finding nothing to harmonize with it, wherever it comes forth a disagreeable speck is produced. In summer, when all other trees are in their pride, it is

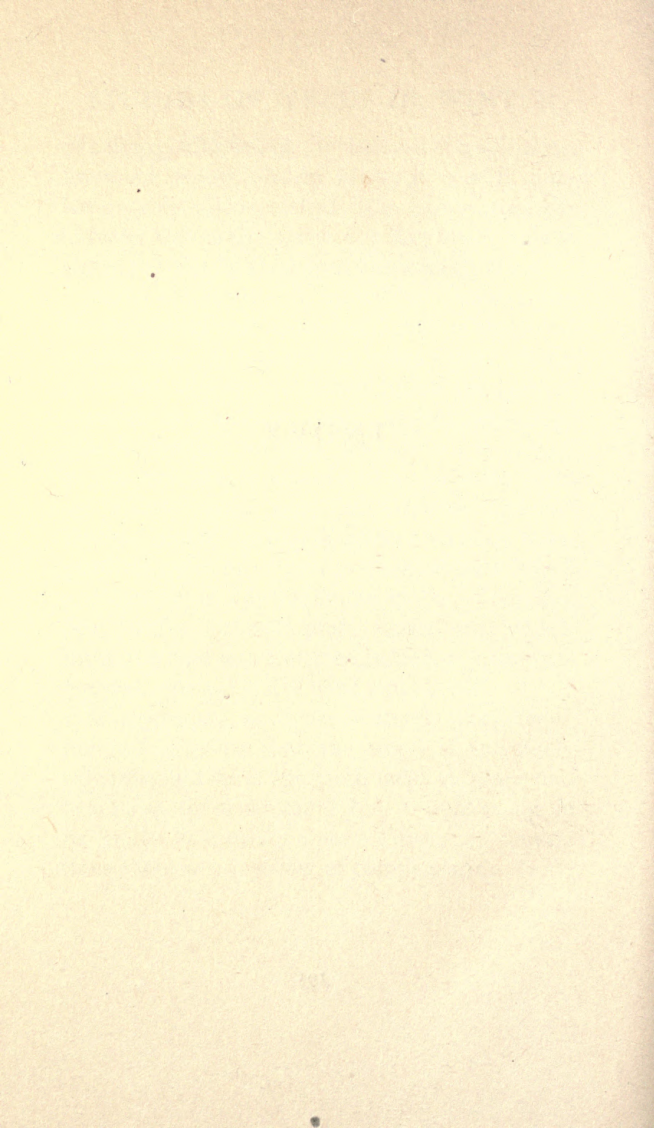
STUDIES OF TREES IN WINTER

of a dingy, lifeless hue ; in autumn of a spiritless, unvaried yellow, and in winter it is still more lamentably distinguished from every other deciduous tree of the forest, for they seem only to sleep, but the larch appears absolutely dead."

Many old stories are in existence concerning the durability and incombustibility of the wood of this tree. It is said that Julius Cæsar wished to set fire to a wooden tower before the gates of a castle, in the Alps, which he was besieging ; that he heaped up logs of larch wood around it, but was utterly unable to make them burn, — "*robusta larix igni impenetrabile lignum.*" Evelyn, one of the first English writers on trees, gives an account of a ship made of larch wood and cypress which was found in the Numidian Sea, twelve fathoms under water, and which, though it had lain fourteen hundred years submerged, was yet quite hard and sound.

Exaggerated as these accounts may seem, the fact remains that the wood is extremely valuable, and what the larch lacks in grace and beauty as an ornamental tree it makes up in its merits as a useful one. Thus even among trees there is a just law of compensation.

INDEX



INDEX

ACACIA, rose, 131
Acer, 21
dasycarpum, 26
Negundo, 28, 29
pennsylvanicum, 27, 28
platanoides, 29, 30
Pseudo-Platanus, 30, 31
rubrum, 23, 25
saccharinum, 25, 26
saccharum, 22, 23, 26
spicatum, 28
Aceraceæ, 21
Æsculus glabra, 17
Hippocastanum, 15, 17
Ailanthus, 160
glandulosa, 160, 161
Amelanchier, 174
canadensis, 173
Angelica tree, 162
Apple tree, 167
Aralia spinosa, 162, 163
Araliaceæ, 153, 162
Ash, American, 36
black, 38
buds, color of, 40
downy, 37
European, 39
excrescences on the, 36
green, 36
red, 37
seeds, 41
white, 36
Ashes, 9, 35, 41
Aspen, 179
American, 179
large-toothed, 181

BALM of Gilead, 182
Bark, 6, 7
color of, 7
taste of, 7
Basswood, 141
small leaved, 141
white, 141
Beech, 7, 77
American, 77
blue, 72
European, 79
purple, 80
Betula, 61
alba, 68
lenta, 63, 64
lutea, 64, 66
nigra, 66
papyrifera, 60, 61
populifolia, 62, 63
pumila, 68
Betulaceæ, 59
Bigelow, 158
Bignoniaceæ, 153, 158
Birch, 59
American, 62
beer, 64
black, 63
canoe, 7, 60
dwarf, 68
European white, 68
gray, 62
paper, 60
red, 66
river, 66
sweet, 63
white, 60, 62

INDEX

Birch, yellow, 64
 Birches, 59
 Bosc, 169
 Butcher, 80
 Box elder, 28
 Branches, 6, 7, 10
 Bryant, quoted, 119
 Buckeye, Ohio, 17
 Buckeyes, 15
 Buds, 6, 10, 11
 accessory, 11
 adventitious, 11
 axillary, 6, 10
 collateral, 11
 flower, 11
 flowers in the, 10
 latent, 11
 lateral, 6, 10
 scales of, 9
 superposed, 11
 terminal, 6, 10
 winter, 11
 Bundle-scars, 10
 Butternut, 11, 45
 sugar from sap of, 47
 Buttonwood, 117

CAMBIUM layer, 5, 6
Carpinus, 73
 caroliniana, 72, 74
Carya, 45, 51
 alba, 51
 cordiformis, 53
 glabra, 54, 56
 ovata, 49
Castanea, 82
 dentata, 81, 83
 Catalpa, hardy, 158
 speciosa, 158, 160
Celtis, 101
 occidentalis, 112, 113
Cercis canadensis, 136
 Cherry, bird, 172

Cherry, black, 7, 171
 choke, 172
 pin, 172
 red, 172
 sweet, 172
 Chestnut, 77, 81
 Spanish, 82
Cladrastis, 134
 lutea, 134
 Cook, 80
 Cork tree, 89
Cornacea, 120
 Cornel, flowering, 121
Cornus, 122
 florida, 121, 122
 Cottonwood, 183
 swamp, 184
 Cucumber tree, 155

DOGWOOD, 120
 flowering, 121
 poison, 121
 Du Hamel, quoted, 143

ELM, 101
 American, 5, 10, 101, 102
 cork, 7, 107, 144
 Dutch, 111
 English, 101, 108
 feathered, 11, 103
 Lancaster, 103
 red, 105
 rock, 107
 Scotch, 111
 slippery, 7, 105
 Thomas's, 107
 white, 102
 wych, 111
 Elms, 101
 Emerson, quoted, 37, 39, 87, 91,
 94, 108, 119, 183
 Evelyn, quoted, 41, 80, 190

INDEX

- FAGACEÆ*, 77
Fagus, 79
 grandifolia, 77
 syvatica, 78, 80
Fraxinus, 35
 americana, 36
 excelsior, 39
 nigra, 38
 pennsylvanica, 37
 Fruit, 8
- GERARD, quoted, 70, 111, 180
 Gilpin, 80, 119
Gleditsia, 133
 triacanthos, 132, 133
 Gray, quoted, 47, 119
 Growth, 6, 9, 10
 annual rings of, 6
Gymnocladus dioica, 135
- HACKBERRY, 101, 112
 Hackmatack, 187
Hamamelidaceæ, 141
Hamamelis, 144, 146
 Hamerton, quoted, 69
 Heartwood, 5, 6
 Hercules' club, 162
 Hickories, 9, 45
 Hickory, bitternut, 53
 mockernut, 7, 51
 pignut, 54
 shagbark, 7, 49
 shellbark, 49
 whiteheart, 51
Hippocastanaceæ, 15
 Holmes, quoted, 109, 118
 Homer, quoted, 180
 Hop hornbeam, 8, 71
 Hornbeam, 7, 72
 Horsechestnut, 8, 9, 15, 41, 143
 Horsechestnut buds, 15, 16
 Horsechestnut flowers, 16
 leaf-scars, 15
 twigs, 15
- INDIAN bean, 158
 Internodes, 9
 Ironwood, 71
- JEKYL, quoted, 69
 Judas tree, 136
Juglandaceæ, 45
Juglans, 45, 47
 cinerea, 45
 nigra, 48
 regia, 49
 Juneberry, 173
- KENTUCKY coffee tree, 129, 135,
 160, 161
- Knight, 169
- LABURNUM vulgare*, 136
 Larch, 187
 American, 187
 European, 188
Larix, 188
 decidua, 188
 larcina, 187
Lauraceæ, 141, 147
 Leaf-scars, 9, 10
Leguminosæ, 129
 Lenticels, 8, 16
 Lime trees, 143
 Linden, 141
 common, 141
 European, 141, 143
 Linnæus, 28, 67, 143, 145, 146
Liquidambar, 144, 145
 Styraciflua, 144, 146

INDEX

- Liquidamber, 7, 144
Liriodendron, 153, 157
 Tulipifera, 155
 Locust, clammy, 131
 common, 129
 honey, 132
 Loudon, 31, 111, 124, 148
 Lowell, quoted, 24
 Lubbock, quoted, 156
- MAGNOLIA acuminata*, 155
 swamp, 153
 tripetala, 154, 155
 virginiana, 153
Magnoliaceæ, 153, 157
 Maple, 21
 ash-leaved, 28
 bird's eye, 23
 curled, 25
 moosewood, 27
 mountain, 7, 28
 Norway, 29
 red, 10, 11, 23
 rock, 22
 silver, 25
 striped, 7, 27
 sugar, 7, 22
 swamp, 23
 sycamore, 30
 white, 25
 Maples, 9, 21, 41
 Maple sugar, 22, 23
 Mathews, 80
 Medullary rays, 6
 Michaux, 55, 79, 88, 145
 Milton, quoted, 109
Moracæ, 122
Morus, 123
 alba, 123, 124
 rubra, 123
 Mountain ash, 170
 Mulberry, red, 123
 white, 122, 124
- NETTLE tree, 112
 Nodes, 9
Nyssa, 120
 sylvatica, 120
- OAK apples, 93
 bear, 97
 black, 92
 bur, 88
 chestnut, 89
 chinquapin, 90
 dwarf chestnut, 90
 mossy-cup, 88, 144
 overcup, 88
 pin, 96
 post, 91
 red, 93
 rock chestnut, 89
 rough, 91
 scarlet, 95
 scrub, 97
 swamp white, 86
 white, 85
 Oaks, 9, 77, 83, 84
Oleaceæ, 35
Ostrya, 72
 virginiana, 71, 72
 Ovid, quoted, 110
- PALLAS, quoted, 182
 Peach tree, 172
 buds of, 173
 Pear tree, 169
 Pepperidge, 120
 Phyllotaxy, 81, 82
Pinacæ, 187
 Pith, 6, 8
 color, 8
 form, 8
 rays, 6
 Plane tree, 117
Platanacæ, 117

INDEX

- Platanus*, 119
occidentalis, 117, 119
orientalis, 119
- Plum, 172
- Poplar, balm of Gilead, 182
 balsam, 182
 Carolina, 183
 cottonwood, 183
 Lombardy, 184
 necklace, 183
 swamp cottonwood, 184
 white, 184
- Populus*, 177, 181
balsamifera, 182
deltoides, 183, 184
grandidentata, 181, 182
heterophylla, 184
tremuloides, 179, 181
- Prunus*, 172
avium, 172
domestica, 172
pennsylvanica, 172
Persica, 172
serotina, 171, 172
virginiana, 172
- Pyrus*, 168
americana, 170, 171
communis, 169
Malus, 167
sambucifolia, 171
- QUERCUS**, 83, 85
alba, 85
bicolor, 86
coccinea, 95, 96
ilicifolia, 97
macrocarpa, 88, 89
palustris, 96, 97
prinoides, 90, 91
Prinus, 89
rubra, 93, 95
stellata, 91
velutina, 92, 93
- REDBUD**, 136
Robinia, 130
hispidata, 131
Pseudo-Acacia, 129, 130
viscosa, 131
- Rosaceæ*, 167
- Rowan tree, 170
- SALICACEÆ**, 177
Salix alba, 177
babylonica, 178
nigra, 179
- Sapwood, 5
- Sargent, quoted, 104, 107, 124, 135, 145
- Sassafras, 7, 141, 147
Sassafras variifolium, 147
- Scars, 9
 fruit, 9
 leaf, 9
 stipule, 9
- Service berry, 173
- Scott, quoted, 69, 180
- Shad bush, 173
- Shenstone, quoted, 70
- Silkworms, 124, 125
- Simaroubaceæ*, 153, 159
- Sour gum tree, 120
- Spenser, quoted, 180
- Stems, 8, 9
- Stipules, 9
- Sugar berry, 112
- Sumac poison, 121
- Sweet bay, 153
- Sweet gum, 144
- Sycamore, 117
- TAMARACK**, 187
 Tennyson, quoted, 40, 41
 Thoreau, 24
 quoted, 65, 148

INDEX

- Thorns, 8
Tilia americana, 141
Tiliaceæ, 141
 Tree of heaven, 160
 Trees, 3, 4
 age of, 6, 8, 9
 dool, 31
 Trunk, tree, 5
 deliquescent, 5
 dicotyledonous, 5
 excurrent, 5
 Tulip tree, 153, 155
 Tupelo, 7, 120
 Twigs, 8
- ULMACEÆ*, 101
 Umbrella tree, 154
Ulmus, 101, 105
 americana, 102
 campestris, 108, 110, 112
- Ulmus fulva*, 105, 106
 glabra, 111, 112
 racemosa, 107, 108
- VASCULAR bundles, 10
 Virgil, quoted, 110
 Virgilia, 135
- WALNUT, black, 48
 English, 49
 Walnuts, 8, 9, 45
 Willow, black, 179
 "pussy," 178
 weeping, 7, 178
 white, 177
 Witch-hazel, 146
 Wood, 5, 6
 silver grain of, 6
 Wordsworth, quoted, 189
- YELLOWWOOD, 129, 134



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